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Breech-Loading Firearms.

The Board of Ordnance officers, consisting of Col. Ripley, Major Ramsay, and Captain Maynadier appointed by the Secretary of War to examine and test all breech-loading firearms that might be presented to them, with a view of adopting a model for the alteration of the old arm to breech-loading, have submitted to the Department a report of their experiments lately made at West Point in obedience to instructions. From reports received from outside spectators at the trials, which are embraced in the statement published on page 390 of the present volume of the SCIENTIFIC AMERICAN, we were inclined to believe that Mt. Storm would have been the successful competitor, but in this we were mistaken, as will be seen by the following concluding paragraph of the report, which embodies the practical result of the labors of the Board :—

"The Board select Morse's model, inasmuch as it differs from the others by including the new and untried principle of a primed metallic cartridge, which may, on actual trial, be found of advantage; and they recommend that the appropriation, or so much of it as the Secretary of War may deem necessary for the purposes of trial by troops in service, be applied to the alteration of old United States arms upon Morse's model, with certain modifications suggested by him."

The other Ordnance Board recently assembled at West Point, under that part of the same act which makes an appropriation "for the purchase of breech-loading carbines of the best model to be selected and proved by a board of Ordnance officers," have not yet made their report.

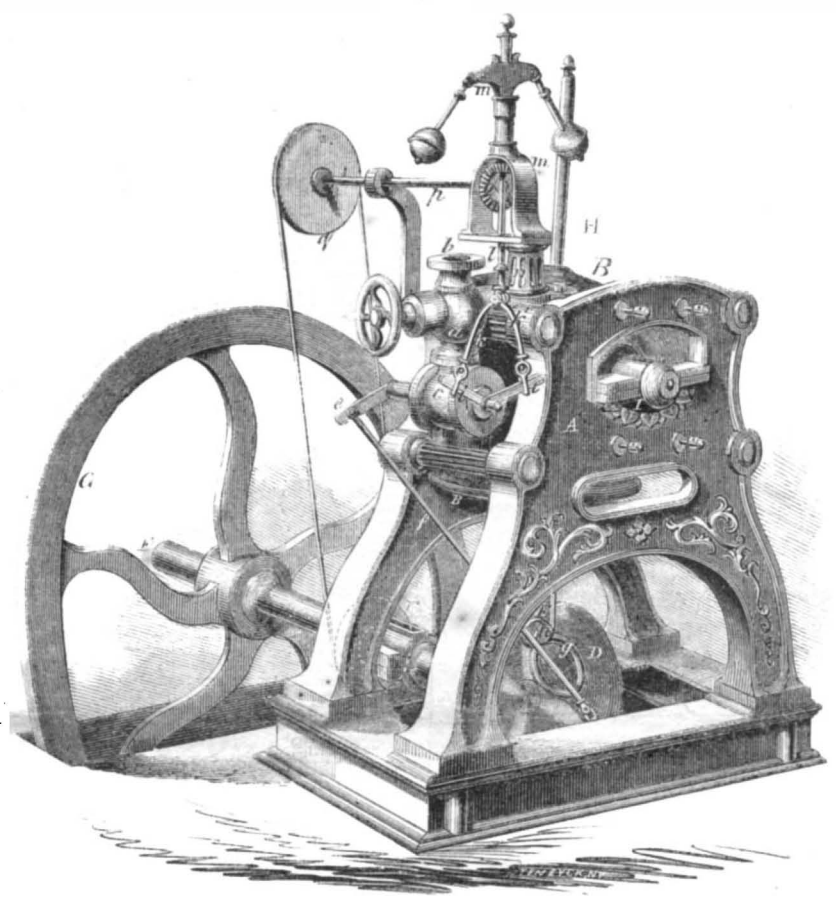
An Instrument for Examining the Eye.

An ingenious instrument called the opthalmoscope, by the aid of which the eye may be internally examined, has recently been introduced to the notice of the scientific world. The instrument is in the form of a concave mirror, with a hole in the center, in which a lens is inserted, and to this another lens is added, which, however, is separated and movable. When the instrument is used a lighted candle is placed at the side of the patient. The concave mirror is then held in front of the eye to be examined, while the movable lens is suspended between the light and the mirror in such a manner as to concentrate the rays of the first on the second. The reflected rays converge on the retina, and on passing through it, diverge and render luminous the whole interior of the eye, which the observer can see by looking through the lens placed in the mirror's center. The retina and the lens form a microcope, the multiplying power of which is about five hundred.

SCIENTIFIC BURGLARY.—One of the most recent improvements used by burglars in this city is the use of the blowpipe, to draw the temper of the chilled iron and steel placed as a guard against cutting instruments around the locks of safes and vaults.

MACKINTOSH & WADSWORTH'S CUT-OFF AND GOVERNOR VALVE.

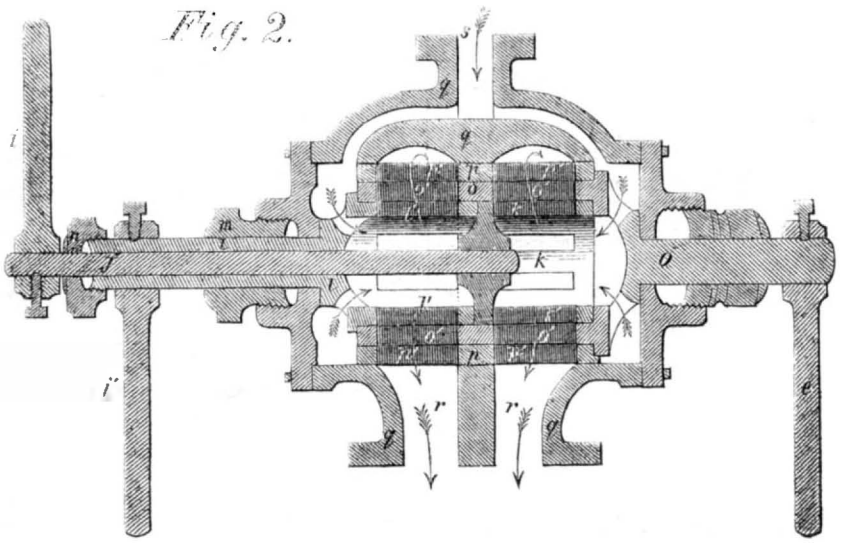
Fig. 1



This invention is a novel arrangement of hollow rolling balanced valves, which affords great convenience for adjustment to cut off the steam at such a point in the stroke of the engine as may be desired under the average or usual load of the engine, and average or usual pressure of steam, but which is capable of being controlled by a governor in such a manner as to vary the point of cut-off to meet variations in the steam pressure or load on the engine, and thereby regulate its velocity.

Our engravings fully illustrate the invention; the first is a perspective view showing its application to an oscillating steam engine, in which A is the frame of the engine, B the cylinder, D the crank, and E the piston rod. F is the main shaft, G the fly wheel, H is a guide

Fig. 2.



rod, and I is the trunnion box or bearing; *a* is the throttle valve, *b* the steam entrance, *c* the cut-off and governor valve box, *e* the lever of the regular cut-off, *f* the connecting rod with crank on the end wrist, *g* crank on the end wrist moving the regular cut-off by rod *f* and lever, *e*; *h* is the crank pin; *i i'* are levers moving the governor valves, *k k'* governor valve rods, *l* is the governor rod, *m* the governor, *n* the governor frame, *o* the gearing that drives the governor from the wheel, *r*, on the main shaft by the belt and wheel *q*, and shaft, *p*. Fig. 2 is a vertical longitudinal section of the cut-off, which we will now describe: *q* is a shell or case (*c* Fig. 1), a passage, *s*, in which communicates with the throttle valve, and the steam enters this shell in the direction of the arrow, passing out through the passages, *r*, to the upper or lower end of the cylinder at each stroke of the piston; *p* is the valve seat, having ports, *p'*, in it. In this valve seat works the positive cut-off, *o*, provided with ports, *o'*, and operated by a stem or shaft passing through a stuffing box in one end of the shell, *q*, to which is attached the lever, *e*, operated from the crank by the rod, *f*. In order that the induction of the steam may be controlled by the governor there works inside the cut-off, *o*, a valve, *l*, having ports, *l'*, the stem of which, *l*, is hollow and passes through a stuffing box, *m*, in the end of the shell, *q*. This is operated by the governor being connected with it by a lever, *i'*. There is another valve, *k*, working inside the cut-off, *o*, to regulate the width of the other set of ports, *o* and *p'*, and this is connected to a solid stem, J, that passes through the hollow stem, *l*, and through a stuffing-box, *n*, at its end. It is operated from the governor by the lever, *i*, seen also in Fig. 1. One of the valves regulate the cut-off of the steam to one end, and the other to the other end of the cylinder.

The operation is simple, the steam entering at *r* passes inside the valves and through the ports into an annular passage, and so out at *r*. As the quantity of steam supplied the cylinder depends upon the area of the ports, it is evident that as the governor controls the area of these ports, opening them wide when they are low and revolving slowly, and closing them altogether when revolving too fast or are too high, but the valves being properly arranged in relation to each other and the governor, they will keep the engine at the proper speed, under the varying pressure of steam in the boiler, and the varying amount of work which may be on the engine.

This cut-off is the invention of W. S. Mackintosh and S. Wadsworth, of Pittsburg, Pa., and they have assigned their interest to Cridge, Wadsworth & Co., of the same place, from whom any further particulars can be obtained. A patent was granted on the 17th inst., and the claim will be found on the next page, and in another column will also be found an advertisement of the assignees.

Hydrophobia Signs.

As we have recently heard of several persons who have died of this terrible malady by having been bitten by dogs not supposed to be affected with *rabies*, a few words of caution on the subject may be of great benefit to the public. It is commonly supposed that this disease in dogs is caused exclusively by hot weather and the want of water. This is a mistaken notion, according to the famous Dr. John Hunter, who states that, for a period of forty years, in Jamaica, a dog was never known to go mad, although great numbers were kept on the island. In Aleppo, in Turkey in Asia, dogs often die by the heat of the climate and for want of food and water, yet this distemper is unknown among them. Hydrophobia, or fear of water, is a wrong term when applied to dogs, but is correct as applied to human beings. Rabid dogs, according to the experiments of Magendie, do not dread water, nor are they always furious, as is generally believed. The common opinion that they *all* dread water, and are furious, has led to the many fatal mistakes to which we have alluded in the cases of those persons bitten by dogs not believed to be mad. A peculiar uneasiness, with a slouching gait and wildness of eye, are the truest signs of *rabies* in a dog. When these are observed, the dog should be confined by his master, or avoided when met.

LOOK TO YOUR CISTERNS.—Those who receive their supply of water through cisterns, for drinking and culinary purposes, should take care to clean them out oftener than many do.

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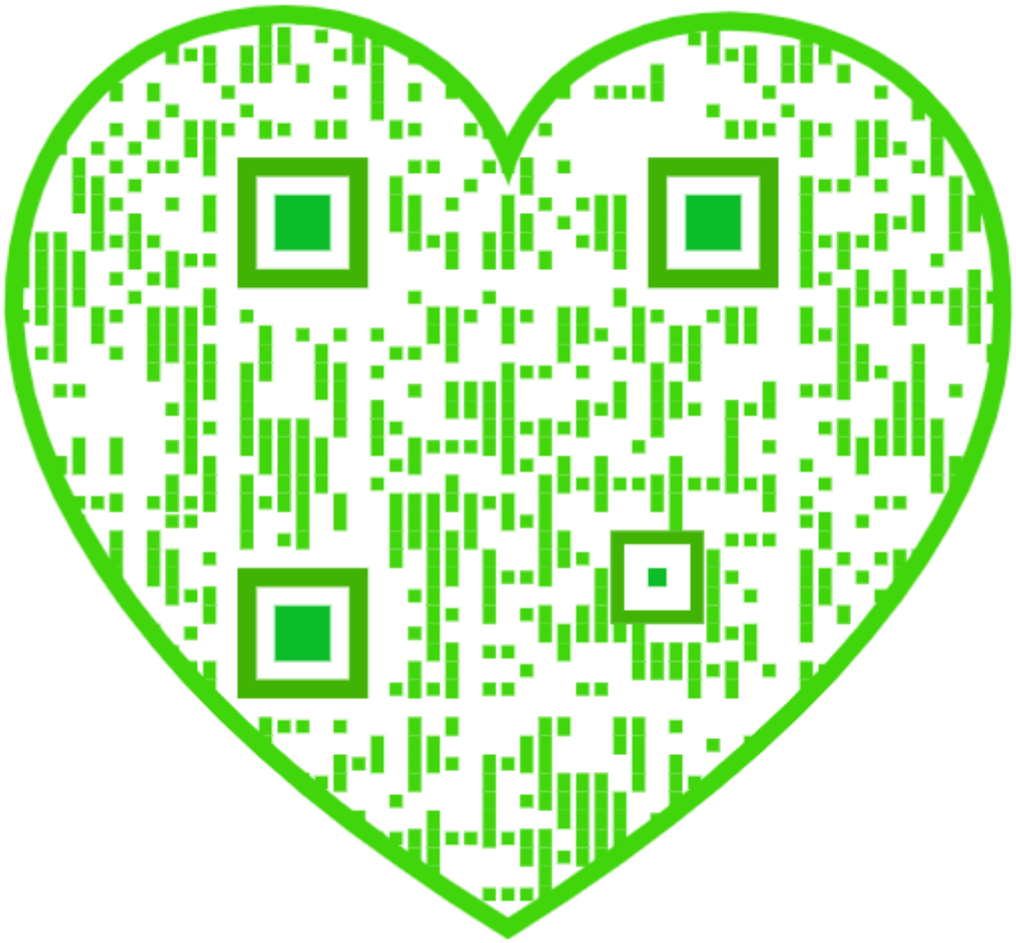

IMPORTANT TO INVENTORS.

The rapid growth of our Patent Agency business during the past three years has required a great addition to our ordinary facilities for its performance, and we are now able to announce the completion of a system which cannot fail to arrest the attention of all who have business of this kind to transact.

OUR PRINCIPAL OFFICE

will be, as usual, at No. 128 Fulton street, New York. There is no other city in the Union so easy of access from every quarter as this, consequently there are greater advantages in regard to the transmission of models, funds, &c., through the various channels that center in New York. Two of the partners of our firm reside here, and during the hours of business are always at hand to counsel and advise with inventors. They are assisted by a corps of skillful Examiners, who have had many years of active experience in the preparation of cases for the Patent Office.

To render our Patent Agency Department complete in every respect, we established over a year ago a

BRANCH OFFICE IN THE CITY OF WASHINGTON,

on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

A SPECIAL NOTICE.

We especially require that all letters, models and remittances should be made to our address at New York.

EXAMINATION OF INVENTIONS.

We have been accustomed from the commencement of our business—thirteen years since—to examine sketches and descriptions, and give advice in regard to the novelty of new inventions, *without charge*. We also furnish a printed circular of information to all who may wish it, giving instructions as to the proper method which should be adopted in making applications. This practice we shall still continue, and it is our purpose at all times to give such advice free and candidly to all who apply to us. *In no case will we advise an inventor to make application unless we have confidence in his success before the Patent Office.*

Our extensive experience in mechanical and chemical improvements enables us to decide adversely to nearly one half of the cases presented to us for our opinion, before any expense has occurred in the preparation of the case for a patent.

When doubt exists in regard to the novelty of an invention, we advise in such cases a

PRELIMINARY EXAMINATION

to be made at the Patent Office. We are prepared to conduct such examinations at the Patent Office through our "Branch Agency," upon being furnished with a sketch and description of the improvement. Our fee for this service will be $5.

After sufficient experience under this system, we confidently recommend it as a safe precautionary step in all cases before application is made for a patent—not that there will be no rejections under this system. It is impossible to avoid such results in many cases, owing to the exceedingly wide range taken by the Examiners in the examination of cases; but, nevertheless, many applicants will be saved the expense of an application by adopting this course. Applicants who expect answers by mail must enclose stamps to pay return postage.

THE COSTS ATTENDING AN APPLICATION

for a patent through our agency are very moderate, and great care is exercised in the preparation of specifications, drawings, &c. No cases are lost for want of particular care on our part in drawing up the papers, and if the claims are rejected, we enter upon a speedy examination of the reasons assigned by the Commissioner of Patents for the refusal, and make a report to our clients as to the prospects of success by further prosecution.

A circular containing fuller information respecting the method of applying for patents can be had gratis at either of our offices.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, enclosing the official letters, &c.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Inventor will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

Communications and remittances should be addressed to

MUNN & COMPANY,
No. 128 Fulton street, New York.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

Issued from the United States Patent Office

FOR THE WEEK ENDING AUGUST 17, 1858.

[*Reported officially for the Scientific American.*]

*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

CORN SHELLERS—Calvin Adams, of Pittsburg, Pa.: I claim the combination of the pairs of adjustable and yielding wheels, C and C′, with the pairs of shelling wheels, Q and Q′, when constructed and operating substantially in the manner and for the purpose described.

I also claim the manner of connecting the shafts, C and C′, with their respective cog wheels, H′ H, by means of the pivots, a a, and conical hub, E, or their equivalents, so that whilst they may revolve together, the shafts may play back and forth to adapt the feeding wheels to the various sizes of the ears of corn to be shelled, substantially as described.

WASHING MACHINE—David Allan, of St. Louis, Mo.: I claim the air chamber or concave top of dasher, G G, or its equivalent.

CHURN—James S. Appleton, of White River Junction, Vt.: I claim securing the churning vessel, m, within a freely swinging frame, when the dasher of the churn is operated by means of a crank shaft, pitman, and vibrating beam, constructed, arranged and operated as set forth.

CROSS-CUT SAWING MACHINE—John T. Armstrong, of Jacksontown, Ohio: I claim the combination of the frame, A, wheel, E, and guide rod, F, with the frame, C, and carriage, L, and saw, I, when arranged in relation to each other, and operated in the manner and for the purposes set forth.

RAILROAD CAR SEATS—James M. Baird, of Wheeling, Va.: I claim, first, The oscillating pedestal, B, and the vertical lever stay, L, in combination with the stationary seat stand, D, and the arrangement of the slats in each, by which to adjust the seat to any position required with the wheel, k, and also the arrangement by which the backs are changed and held permanently to their places by the arm catch, h and g, and the drop catch marked B.

Second, I claim the arrangement of the oscillating foot brace in combination with a lady's foot-stool, as seen in Fig. 3.

Third, I claim the arrangement of the spittoon holder as seen at Fig. 4, for the purposes described.

METHOD OF SECURING THE CUTTERS TO THE SPINDLES OF AUGERS—Charles L. Barges, of New York City: I do not claim a bit having detached cutters, nor a bit by which different sized holes may be bored, by changing the size of its cutters.

But I claim the combination of the spindle, A, cutter, B, and check nut, F, for the purpose of securing the cutter to the spindle, arranged in the manner and for the purpose as set forth.

CORN PLANTERS—Thomas M. Bedgood, of Cleveland, Ind.: I do not claim, by itself, any individual part of the machine described.

But I claim the combination of the truck wheel, E, cam wheel, H, lever, I, and gauge, F, when constructed and arranged in relation to each other, and to the seed-box, C, and spout, J, as described, and operating as set forth.

MACHINE FOR SOWING FERTILIZERS—Lyman Bickford, of Macedon, N. Y.: I do not claim as my invention the formation simply of distributing apertures in the bottom of a hopper of a machine for sowing fertilizers, seeds, or other things, for such are employed in the machine for which Letters Patent were granted to Warren S. Bartle, April 22d, 1856, and in other sowing machines.

But I claim a hopper bottom, A, formed of sheet metal or its equivalent, in which are arranged apertures, a, constructed as set forth, when combined with a series of vertical stirrers, k, and a slide or slides, b, arranged on the inner side of the bottom, A, in the manner and for the purposes substantially as described.

PLOWS—William Black, of Manchester, Pa.: I do not claim either of the individual parts thereof, nor do I claim the precise form of the digger teeth or picks shown and described, as similar ones may be seen on a patent granted E. F. Berry, Feb. 19th, 1856.

Nor do I wish to be understood as limiting my claim to the precise arrangement shown and described of the springs, E, joints, 6, rods, 2 and 3, with the plow, P, and digger, H, as that is susceptible of various other modifications.

But I claim the combining with the plow, P, the adjustable rotary digger, H, having sharp teeth or picks, T, substantially as described, for the purpose set forth.

STEAM HEATING APPARATUS—Henry G. Bulkley, of Kalamazoo, Mich.: I do not confine myself to any particular construction of the furnace or apparatus employed in carrying out my invention,

But I claim the surrounding of the air passages by a steam atmosphere, to which heat is applied after the steam is generated, for the purpose of increasing the temperature of the steam without high pressure, for making a rapid, safe, economical and wholesome heat, substantially as specified.

[This invention consists in heating air for warming houses, buildings or apartments, by causing it to pass through pipes, passages or chambers, which wholly or partially surrounded a chamber containing superheated steam of a limited pressure. The advantage to be derived from this system of heating air, over that of causing it to pass surfaces heated by direct exposure to the fire and heated products of combustion, consists in the impossibility of heating the pipes or passages to such a degree as to effect any de-oxygenation of the air, or as to be in any danger of setting on fire the building in which it is used, both of which effects often result from the last-mentioned method of heating: and the advantage over heating by steam is that the heating surfaces can be more highly heated without dangerous pressure on them, and hence a less amount of surface is required.]

MILL PICK HOLDERS—Jacob P. Brady, of Mountjoy, Pa.: I claim the double socket pick holder, when constructed as described, and used in combination with the diamond-shaped picks in the manner and for the purposes set forth.

CORN PLANTERS—John S. Davis, of Arcadia, Ohio: I claim the adjustable guards, M, truck, K, and adjustable hoppers, I, in combination with the adjustable connecting rods, S S, lever, R, and rod, Q, the whole combined, and operating in the manner described and for the purpose set forth.

BRICK MACHINES—J. W. Crary, of New Orleans, La.: I claim, first, The combination of an annular rim or concave moulding surface, with a roller or convex pressing surface, so that the bricks are moulded by pressure operating toward the circumference, and discharged in a direction toward the axis of said concave moulding surface, substantially as and for the purposes set forth.

Second, Arranging a pug mill, for the preparation of the dry clay, to work in connection with said first feature of my invention by means of the gearing described, substantially as and for the purposes set forth.

[This invention has several peculiar advantages. First, the making of a concave, on the brick while rotating, instead of a convex, surface on the outside of circle, as in other machines, which make the brick on the outer surface of a circle. Second. By means of running the outer surface of the pressing roller to the inner surface of the circle of moulds, a circular and more accurate angle of contact is formed, thereby saving power and presenting the point of pressure required in the moulds directly in a line with the radius of the pressing roller. Third. This machine supplies itself with clay, which is brought near to it in a dry state, and after making the brick, delivers them into the kilns to the setters, in good condition for setting and burning. The capacity of this machine can be increased to any extent, from 10,000 to 100,000 per day. This mode of making brick must, we think, prove to be a decided improvement. It is well known that a great pressure exerted upon any argillaceous pulverized material in a dry state, produces a body more dense and irresistible than can be made of the same material in a soft, hydrous or pasty consistence, and if brick can be well made and burned by this mode, they must be superior to those made in the old way.]

OPERATING STEAM TRIP-HAMMERS—Joseph S. Bonney, of Hanson, Mass., and Charles W. Willard, of Bridgewater, Mass.: We do not claim the combination of a bent rocker lever, an actuator and two adjustable cams, applied together and to a valve rod and trip-hammer, as represented in the specifications and drawings of the aforesaid patent.

But what we do claim is our improved arrangement and application of the parts, the same consisting not only in having a curved pendulous lever to extend from the hammer shank, or a projection therefrom, and play through and in the valve rod as described, but in arranging and applying cams and adjustable bearers with respect to the said lever, and to operate together and produce a reciprocating motion of the lever, essentially in the manner and for the purpose as specified.

REVOLVING FIREARMS—W. W. Elliott, of Plattsburg, N. Y.: I claim, first, Extending the frame of the breech forward of the supporting point of the cutter pin, and placing in the part so extended the cock, c, and trigger, d, when these devices are arranged in relation to the several revolving barrels, as specified.

Second, The arrangement of lever, o, and trigger, d, in advance of dog, p, and ratchet, y, by which the barrels are revolved, as and for the purpose specified.

Third, The method of operating the cock, c, by means of fly, g, the same being hinged at or near the centre of motion of the cock, and moving independently of the cock in one direction but not in the other, as and for the purpose specified.

Fourth, The employment of wings, a′, when so constructed as to serve the double purpose of bracing the support of the center pin, and of protecting the hands from injury by the discharge of gases and pieces of caps from the nipples, and being a portion of the frame of the breech, as set forth.

PESSARIES—William Elmer, M. D., of New York City: I claim giving the peculiar form to the curved bar or tube, A, described and represented, and attaching to its posterior or rear part a ring-shaped cup or inverted frustrum of a cone, C, in such relation thereto as to enable the instrument to perform the functions for which it is designed, in the manner and for the purpose before described.

METALLIC BANDS FOR BINDING BAILS—Wm. Field, of Providence, R. I.:—I do not confine myself to the staple-shaped key, as shown in the first described clasp, as two single keys may be used, and produce the same effect in preventing the loops from slipping.

I claim, first, arranging the band over the clasp, and the ends of the band which are bent under to form the loops by which the band is connected with the clasp, so that the ends lay above the clasp and the band covers and protects both of these ends, and also the clasp, substantially as described.

Second, Connecting the looped ends of the band with the clasp by means of a double key or its equivalent, arranged substantially as described, so that the turning of the key prevents the loop from slipping, as described.

Third, Arranging the key or keys on the under side of the band and clasp for the purpose described.

STOVES—Cornelius O. Foley, of Troy, N. Y.: I claim, first, The arrangement within the outer casing of the stove of the chambers, G, D, descending and ascending flues, H H′, J J′, and exit pipe, C, with the open front combustion chamber, B, provided with the opening, F, as described, whereby what is known as the "Franklin stove" is made a good radiator without materially impeding its draft, as set forth.

And I also claim the division plates, E, furnished with the opening, F, and constructed and arranged in combination with the chambers, G, D, flues, H H′, J J′, smoke pipe, C, and fire chamber, B, in the stove, substantially as and for the purpose set forth.

MACHINERY FOR PREPARING OVAL PICTURE FRAMES—William Gardner, of New York City: I claim a lathe with a face plate revolving in an oval path, in combination with a scraper adapted to the form of the desired moulding of the oval frame, when the said scraper is so arranged as to be self adjusting laterally with the said moulding, substantially as and for the purpose set forth.

LOCK—Fayette Gould, of Huntington, N. Y.: I am aware that sliding slotted tumblers have been used and arranged in various ways in locks, and also used in connection with guards and other devices for rendering locks unpickable or burglar proof. I therefore do not claim, broadly and separately, series of sliding tumblers provided with notches or recesses at varying points.

But I claim, first, the rotating plate or boss, C, placed within the annular ledge, a, and provided with a key chamber or recess, b, and yielding or elastic pin, E, in combination with the sliding tumblers, k, notched or recessed as shown, the above parts being arranged substantially as and for the purpose set forth.

Second, The rotating plate or boss, C, arranged with the sliding plate, D, and tumblers, k k′, in combination with the check or guard tumblers, n′, substantially as and for the purpose specified.

[This invention relates to an improved lock of that class which are designed to give greater security than ordinary kinds, and which are capable of having their parts so changed that different keys may be required to open them. The invention consists in the employment or use of two sets of sliding tumblers in connection with a rotating plate or boss, provided with a key chamber and slide.]

WRENCH—Francis D. Haywood, of Walden, Mass.: I claim the wrench constructed substantially as described, *i. e*, combining with the head or upper jaw, when rigidly connected with its shank, a brace and screw arranged respectively on opposite sides of, and parallel with, the said shank, for the purposes of insuring true play of the slide or lower jaw, and of keeping the slide and head constantly parallel.

MACHINE FOR CUTTING MITRES—Stephen W. Hall, of Williamsport, Pa.: I do not claim as my invention the use of knives, A A, adjusted at right angles, and attached to the sliding rest, B, since the same arrangement substantially is shown in the combination patented by George Le Baw June 27th, 1854.

But I claim, first, The use in mitre machines of the flanges, G G, and the groove, X, in the frame, E E, for the purpose of guiding and sustaining the outer and inner edges of the knives, A A, and preventing them from springing, substantially as set forth.

Second, I claim the combination together of the flanges, G G, the frame, E E, with the groove, X, and sliding rest, B, substantially in the manner and for the purpose set forth.

APPARATUS FOR HEATING MASH TUBS—Adolph Hammer, of New York City: I am aware that Bessemer's apparatus for warming saccharine liquids both warms the contained liquid, and washes the molasses from the crystalline sugar; but this apparatus is in no way adapted for producing and extracting from malt the required saccharo-mucilaginous matter which, with water, constitutes wort. I therefore do not claim anything appertaining to said apparatus.

But I claim the arrangement on the outside of the mash tun described, and in combination therewith, of a steam heater, in such a manner that any suitable quantities of the fluid extract of the malt may, at the discretion of the operator, be withdrawn from the tun through the said heater, so as to be warmed by the latter as it passes through the same to any suitable receiver provided for the purpose, that it may immediately afterward be returned into the tun for the purpose of raising the temperature of the mash therein to the degree required as described; the said heater being connected with the interior of the tun, and the said pipes being provided with cocks, substantially in the manner set forth and described.

NAIL PLATE-FEEDER—John W. Hoard & Thomas A. Searle, of Providence, R. I.: We claim, first, the polygonal concave sided and oblique grooved feed bar, K, applied in combination with the pins, e e, on the feeding shaft substantially as set forth, to produce the feed movement of said shaft by its own revolution, and to provide for variation in the feed.

Second, the arrangement of the feed bar, K, the driving shaft, R, and driving gear, I, and the plate, t, for throwing out the stop pawl of the running back mechanism in the same movable frame, which is liberated by a latch lever, actuated by the feeding shaft, and thus permitted to be operated upon by a spring, L, or its equivalent, the whole operating substantially as set forth.

[This is a contrivance for varying the distance of the feeding movement to cut nails of different widths or thicknesses. There is also a certain arrangement of parts for stopping both the forward and the rotary motion of, and causing the running back of, the plate-holder when the plate is all cut up.]

MODE OF SECURING AND ADJUSTING THE STEPS OF MILL SPINDLES—Gideon Hotchkiss, of Windsor, N. Y.: I claim the double fulcrum lever operating outside of the shell and over the base, resting on two raised fulcra on the shell fitted to said levers, and the suspending the sway bar and pot by means of sway bolts passing through said lever, in the manner described; also the flanges, e e, on the bottom of the pot.

I also claim the manner of supporting the regulating screw on an adjustable base or safety lightener, by which the stones can be quickly raised and returned again to the same position, substantially as described, in combination with the foregoing arrangement.

RECIPROCATING SAWING MACHING FOR SAWING PLANK—William C. Huntington, of Newark, N. J.: I do not claim making the saw guides, F, G, adjustable to different angles with the line of the cutting edge of the saw, to give to the saw a greater or less amount of cut. Nor do I claim making the feed adjustable to increase or lessen the amount of feed to be given to the lumber being sawed. Nor do I claim a cam shaped dog for the purpose of alternately taking and releasing its hold, to transmit an intermittent motion. Nor do I claim straining and tightening the saw, by attaching to it a tightening belt.

But I claim, first, Connecting the saw wheels, a, b, to the cross-heads, c, d, by pivots, when the saw is worked without a saw gate, and is strained and tightened by being attached to a tightening belt, as and for the purposes set forth.

Second, the combination of the cam shaped feeding and retaining dogs, p and r, operating in opposite directions to each other, with the flanged disk, o, for the purpose of communicating a feed motion to the lumber being sawed, and retaining the lumber firmly in place while the saw is cutting it, as described.

CONSTRUCTION OF CANAL BOATS—Anson Judson, of Unadilla, N. Y.: I do not claim the tube for the ingress and egress of the water through said boat as motive or propelling power, or the use of the wheel as described to force the water through said tube.

But I claim the wide openings in the bow and stern of the boat, extending to or near the full width of the boat, and as low as the bottom, substantially as and for the purposes set forth.

SMUT MACHINES—J. N. Lester, of Oswego, N. Y.: I do not claim separately the parts described, for they or their equivalents have all been used under different forms of arrangement, and in connection with various devices, forming the majority of smut machines in use. I am not aware, however, that sinuous scouring passages arranged with a fan, hollow shaft, cylindrical case, and induction blast spout, as shown, have been used.

I claim the rotating conical plates, F F″, attached to the hollow shaft, E, in combination with the stationary conical plates, D D′ D″, rims, C, cylinder case, G, and fan, I, the plates, F F′ F″ and D D′ D″, being provided with scouring ledges, l, n, and the whole arranged relatively with the fan, I, induction spout, J, and blast spout, K, substantially as and for the purpose set forth

[In this machine a series of rotating and stationary and conical scourers are used, placed on a hollow shaft, and the whole arranged relatively with a fan, so that the grain will be freed from smut in a very expeditious manner.]

BRIDGE—Stephen H. Long, of Louisville, Ky.: I claim, first, The combination of the suspension truss frame with the suspension arch or arches, or the arch stay, substantially in the manner and for the purposes set forth.

I also claim, in combination with the truss frame, the auxiliary stays, arranged therein, as a means of strengthening and fortifying said truss frame, as stated.

AMALGAMATING GOLD AND SILVER—Samuel Longman, of Brooklyn, N. Y.: I do not claim as my invention the machine herein described, and I do not confine myself to the use of my particular machinery or apparatus in performing my invention.

I claim masticating or kneading, in the manner set forth, the dry metaliferous powder of the gold and silversmith's sweeps, scraps and polishings, or the native precious metals, when so prepared with quicksilver, when sprinkled with barely sufficient water to cause the mass to aglutinate.

ROCK DRILLS—W. W. Loomis and John Hewitt, of St. Louis, Mo.: We claim the combination of the two grooved guide rods, A′ A, with the drill bar and the two palls, J J, and nuts, I I, whereby the two guide rods are allowed to fall with the drill bar, so as to keep the top and bottom guides always the same distance from the end of the drill bar, all substantially as set forth.

EXCAVATING MACHINES—William R. Maffett, of Wilkesbarre, Pa.: I claim, first, The arrangement of excavating implements on either end of the beam, in such manner that the weight of one scoop or implement is made to counterbalance and assist the other, the said beam being capable of moving longitudinally forward or backward, and of swinging to the right or

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left, or up or down, each motion being had separately or in combination, whereby the loading of one digging implement and the dumping of the other form part of the same operation, as described.

Second, Constructing and arranging the toothed picker and scoop in such manner that they may be turned with respect to the beam, substantially as set forth.

Third, In combination with the arrangement for turning the scoop and picker on the beam, I claim attaching them so that they may separately be turned on their own axis, whereby the toothed picker may be made to perform the duty of both a digger and a rake, and the scoop that of a shovel and hoe or scraper, substantially as specified.

REAPING MACHINES—C. W. & W. W. Marsh, of Shabbona, Ill.: We are aware that endless bands of rakes have been previously used for conveying cut grain from the platform of reapers, and we do not claim separately and broadly such device.

But we claim the box or receptacle, I, platforms, J, M M, and box, K, provided with the hinged or adjustable bottom end piece, l, p, when the above parts are used in connection with the endless bands of rakes, D, E, and arranged relatively with each other, substantially as set forth as and for the purpose specified.

[This machine gathers the grain as it is cut into proper sized gavels, and enables them to be bound with great facility, and discharges the sheaves from the machine in piles, for the convenience of harvesting them.]

FEED MOTION FOR CEROTYPOGRAPHY—John McElheran, of Brooklyn, N. Y.:—I claim the manner described of causing the type, by their insertion in an adjustable type socket or its equivalent, to regulate their own required position relatively to the impression surface, substantially as specified.

LANTERN FOR BURNING COAL OIL—Max Miller, of Brooklyn, N. Y.: I claim the inverted cup, H, provided with the perforated band, m, and placed over the lamp, D, the band, m, encompassing the wick tube cap, o, in combination with the glass cylinder, C, and the tube, G, or its equivalent, the whole being arranged substantially as, and for the purpose set forth.

[The object of this invention is to dispense with the usual draft chimney, which has been hitherto necessarily used in lanterns for burning coal oil, by so constructing and arranging certain parts that the usual glass globe or cylinder, which has hitherto only served to protect the flame, shall serve the double purpose of protector and draft creator.]

STEERING APPARATUS—Franklin A. Morley, of Sodus Point, N. Y.: I claim the combination of gears and shafts, arranged substantially as described, for operating the rudders of vessels, and at the same time allow them ample room to traverse perpendicularly and vibrate slightly horizontally.

And in combination with the above, I claim making the journals of the shaft, I, longer than the boxes in which it turns, or elongating the hole in the box, E, so the shaft can vibrate horizontally on both of these devices combined to accommodate the pinions, J J, and make them act with the same power or force on each of the gears, K K, as described.

CARPET CLEANER—Augustus W. Noney, of Bridgeport, Conn.: I do not claim the revolving cylinder brush, nor the dust pan, nor the inclosing box, nor the combination of the three, all these having been long known and used.

But I claim the combination and arrangement of said flaps or drags, and the said shields with the revolving cylinder brush, box, and dust pan in the manner described, as and for the purpose specified.

GRAIN DRILLS—Adam Pritz, of Dayton, Ohio.: I claim, first, The employment of a distributing slide E, which has two sets of different character of discharge passages E, F, and a connecting rod H, having two adjusting notches, f, f, in combination with a set screw i, which has a serrated sliding cap k, and with a slotted actuating lever G, which has a serrated rib m, on its upper side, substantially as and for the purposes set forth.

Second, In combination with the above, the employment of short flanged metal tubes K, for securing the flanged gum or leather conducting tubes d, to the drill frame, substantially as and for the purposes set forth.

MACHINE FOR FORGING NAILS—S. S. Putnam, of Boston, Mass.: I do not wish to limit myself to interrupting the motion of the horizontal hammers while the nail is being cut off, as under certain circumstances the vertical pair may be held stationary, or even all four of the hammers may be caught while the nail or other article is being cut off.

Thus far I have spoken of my improvements as particularly applicable to machines for making horse-shoe nails, but it is evident that they are equally applicable to machinery for forging a great variety of other articles. I do not therefore limit my claims to machinery for any particular class of forging, but intend to apply them to forging machinery wherever they may be applicable.

First, I claim hanging the springs which actuate the hammers at points independent of the pivots upon which the helves vibrate, and so far removed therefrom that they shall bear upon the helves nearer to the hammer faces, when the hammers are raised, than at the instant when the blow is given as set forth, for the purpose specified.

Second, I claim the spring E, for actuating the hammers in combination with the set plates F, and screws v, for regulating the tension of the same as set forth.

Third, In combination with the hammers A, and side pieces H, I claim the adjusting checks I, operating in the manner described, for the purpose specified.

Fourth, And in combination with a mechanical cut-off, I claim holding the hammers out of action and without the reach of the cutters whilst the nail is being cut off, as set forth.

Fifth, I claim pivoting the lever M2, to any adjustable block O2, for the purpose of regulating the motion of the nail rod, as set forth.

THRESHING MACHINES—Samuel D. Reynolds, of Lane, Ill.: I do not intend to limit myself to a single series of band cutting blades upon the periphery of the cylinder A, for the reason that I may find it expedient to combine several series of cutting blades and spreading teeth with the periphery of said cylinder. The said cutting and spreading cylinder may be used in conjunction with any description of threshing cylinder.

I claim arranging a band cutting and stalk spreading cylinder, with the threshing cylinder of a threshing machine, substantially in the manner set forth.

REVOLVING FIREARM—Joseph Rider, of Newark, Ohio: I claim, first, Combining the springs, with the hammer, the rotating dog, b, and the peculiarly constructed notched trigger, by means of the reacher, f, constructed, applied and operating substantially as described, to make the single spring serve the purposes of main spring, dog spring and trigger spring.

Second, The combination of the stop lever, l m, with the notched trigger and the reacher, by which the said stop is brought by the single spring, S, into operation on the cylinder as the cocking takes place.

[This invention consists in a certain mode of combining the several parts of the lock, so that a single spring is made to serve in a very effective manner the purpose of main spring and trigger spring, and for keeping in its operative position the dog through which the rotation of the cylinder is effected by the cocking of the hammer, and also for operating the stop which locks the cylinder while the hammer is cocked. It further consists in a mode of applying the rammer in combination with the center spindle by which greater convenience is afforded for taking out the center spindle to permit the detachment of the cylinder.]

WASHING MACHINE—D. C. Rood, of Altona, Ill.: I am aware that rotating cylinders and concaves have been previously used and arranged in various ways for washing clothes, and I therefore do not claim broadly such device separately or in itself considered.

But I claim having the rotating cylinder, B, provided with a flap or door, f, and a flap or fastening, c, and covered by an inflated band or belt or any suitable cloth or fabric, h, in combination with the yielding concave, D, previded with the corrugated board, F, and rollers, j j, the whole being placed in a proper box, A, and arranged substantially as and for the purpose set forth.

[This invention consists in the employment of a hollow rotating cylinder, and a yielding concave placed in a suitable box, the cylinder being provided with a plate or door, a fastener or catch, and covered with an inflated belt or a thick fabric of any suitable material.

SEED PLANTERS—Jonathan H. Rose, of Versailles, Ill.: I do not claim, broadly, the parts pertaining to the shovel plow, nor do I claim the covering shares, F F, neither do I claim, broadly, the employment of an adjustable slide, to regulate the amount of seed to be planted at each dropping, for slides have been arranged in various ways for such purpose. I am not aware, however, that a seed slide and adjusting bar have been arranged as shown, so as to form the exceedingly simple device described, to wit, a supplemental seed chamber and adjustable seed slide combined.

I claim the seed distributiug device formed of the slide, bent or lowered as shown, and the adjustable bar G, fitted in the seed box, E, the whole being arranged and connected with the plow for joint operation, substantially as and for the purpose set forth.

[This is a novel adaptation of a seed distributing device to a plow, whereby the attendant while guiding or holding the plow may actuate at will and with facility the seed distributing device, the same owing to its peculiar construction being capable of ready adjustment, so that the discharge of seed may be regulated as occasion may require.]

ANDIRON—J. B. Sargent, of New Britain, Conn.: I am aware that andirons have been made, having a bolt with a screw on the upper end for the purpose of securing the ornamental pillar, and also having a shoulder on the lower end passing through the legs and fire-iron and riveted on the underside, which cannot be said to be detachable, nor neither do I claim such.

But I claim the construction and arrangement of the legs, A, the fire-iron, B, the pillar, C D, all secured together by the bolt, E, in the nut, c, in the upper portion of the pillar, D, all of which can be readily detached when desired, in the manner and for the purpose as described.

BOMB LANCE—Rufus Sibley, of Greenville, Conn.: I claim first, uniting the front and base of the bomb, or projectile, by tubes or bars in skeleton, substantially as set forth.

I also claim confining the fuse in the fuse tube by drawing down the end of the tube upon the fuse after it is placed therein, for the purpose set forth.

I also claim, in combination with the skeleton shank, or connection, the wings, g g', whether used in pairs or singly, but so that they may be pressed down into and snugly fit the spaces between the skeleton ribs, tubes, or bars, and be thrown out when the bomb is projected, as set forth.

BUTTER BUCKET—J. W. Stimpson, of Baltimore, Md.; What I claim is the new article of manufacture, the same being the double walled butter bucket or kettle, constructed as set forth.

OPERATING CHURNS, &c.—Moses Swan, of Potter Hill.: I claim the arrangement of mechanism specified for combining the churn tub with the wash tub, and giving the plunger and dasher of the same an up and down movement, and at the same time imparting a rotary motion to both tubs, substantially as and for the purposes set forth.

[This is quite a novel and convenient arrangement, it being advantageous to thus combine the churn tub and wash tub, for by so doing the necessity of employing two separate systems of gearing and two persons to perform the two operations is avoided. as both can be performed by one system of gearing, and by one person at the same time. It is also advantageous to have the tubs rotate, for by so doing, if churning is being performed, the whole body of the cream will be more perfectly subjected to the action of the dasher, and if washing is being performed, the plunger will be brought in contact with every portion of the clothes.]

NAIL PLATE FEEDER—James H. Swett, of Pittsburg, Pa.: What I claim is, first, In combination with sleeve, E, and rod, F, the cam slots, a a, and pivoted switch, b, for automatically turning said rod, first in one direction, and then in the opposite one for the purpose set forth.

I also claim glving the rod and nail plate a positive movement during the first of its forward motion by means of the crank, Q, pitman, R, arms, S, crosshead, U, levers, V, and their projecting portions, u, which are then forced apart by the cam wedge, W", and then releasing them by the action of the springs, v, whilst in motion, so that their momentum will carry the nail plate up to the gage, substantially as described.

I also claim, in combination with the nail plate grippers, the spring dogs, for automatically opening said gripers to drop the end of the nail plate, and be ready to receive another one. as set forth.

I also claim, in combination with the rod, F, and swinging plate, M, with its stud, j, the ledge, N, with its openings, for automatically throwing the feed within out of gear, when the nail plate is used up, and into gear again when a fresh plate is supplied, substantially as set forth.

I also claim, in combination with the plate, M, the traversing projection Z, for catching and drawing back said plate, when the nail plate is used up, substantially as set forth.

COMBINATION SHOE TOOL—D. J. Tapley, of Danvers, Mass.: I claim the combination and arrangement of the "tack hole stamp," "last hook," and "peg cutter," substantially as described and for the objects specified.

SEWING MACHINES—Wm. P. Uhlinger, of Philadelphia, Pa. Ante-dated May 3, 1858: I do not desire to claim the vertical arm described in my specification, as that has been used before.

But I claim the vibrating finger, L, in combination with the needle and looper, arranged and operating substantially as described.

MACHINES FOR DIGGING POTATOES—Alex. Wells, of Brooklyn, N. Y.: I claim the rotating spirally flanched diggers, o, in connection with the clearers. P, arranged for joint action, substantially as and for the purpose specified.

[This is an excellent device for digging potatoes and other vegetables, and it is so constructed that the diggers are kept cleared by clearers. It is simple and efficient.]

MACHINES FOR DIGGING POTATOES—Luke White, of Essex, Vt.: I claim the combination of wheel, c, having buckets on the outer edge thereof, with wheels, d, and separator, e, the whole being coustructed and arranged as and for the purpose set forth.

PRINTING PRESSES—Daniel Wolfe, of Dixon, Ohio: I claim the self-emptying spring friskets, u u, arranged with the springing frames, x x, in the manner set forth, and these in arrangement with the stationary bed plate, falling platen frame, L, bars, M and M', and lever, p, when all are combined and constructed in the manner and for the purpose set forth.

GRAIN SEPARATORS—L. Wilcox, of Hudson, Mich.: I claim, first, The reciprocating feeder bar, G, provided with projections, k, placed at the bottom of the hopper, F, and attached to the shoe, E, substantially as and for the purpose set forth.

Second, The two sets of screens e f, placed within one, and the same shoe, E, and arranged relatively with each other, and the hopper, F, substantially as described to operate as set forth.

Third, Giving the screens, e f, a vibratory movement independent of the shake motion of the shoe, E, through the medium of the rods, m m, screens, H, and rod, o, substantially as described for the purpose set forth.

Fourth, The screen, H, attached to the shoe, E, by the rods, m n, provided with the bars, s, and the rock bar, o, for the purpose specified.

[The object of this invention is to augment the working capacity of a grain separator to a very considerable extent by a novel arrangement of the screens, and operating the screens in a peculiar way, and also by a novel device placed in the hopper to agitate the grain, and ensure its proper presentation to the screens.]

GAS BURNERS—Wm. Wright, of St. Louis, Mo.: I lay no claim to any of the devices used in the inventions of C. H. Johnson or E. P. Gleason, or A. H. Ray. or J. C. Walsh, as such,

But I claim the adjustable valve, in combination with the chamber in which the said valve seats, and the adjusting nut around the said valve, whereby the joint is made tight in any given position for the purpose specified.

SEWING MACHINES—J. S. Buell and W. T. Barnes (assignors to J. Forsyth, R. D. Rockwell, V. M. Rice and W. T. Barnes), of Buffalo, N. Y.: We claim, first, The arrangement of the springs, E F G J and I, with the feeder bar, q, and feeder, l, each operating in the manner and for the purpose specified.

Second, The looping apparatus, composed of the framework Y, the spear, S, the hooks t t', and the guide W, operating substantially in the manner and for the purposes described.

CLOTHES' HORSE—E. Culver, Jr. (assignor to himself and S. M. Blackwell), of Shelburn Falls, Mass.: I do not claim joining the rods, b, to standards so that they may be folded up or spread out.

But I claim the combination of the panels, B, panels, C, and connecting links, l l', with a self-supporting pedestal, A, the whole arranged to operate substantially as described for the purpose set forth.

CHUCK FOR LATHES—Simeon Goodfellow (assignor to himself and John Fish), of Troy, N. Y.: I claim the button or stop, H, attached to the slide, I, and arranged relatively with the jaw, C', for the purpose specified.

I further claim adjusting the frame, B, by means of the screw, G, when said frame is arranged with the jaws, C C', and screws, D E, whereby the chuck may be used either as an eccentric or concentric one and manipulated with equal facility in either capacity.

[This invention consists in having the two jaws of the chuck placed within a sliding frame, which is fitted within the chuck block. One of the jaws and the frame being operated simultaneously by means of screws, so arranged that articles of varying diameter may be expediously adjusted in the chuck and accurately centered, the device also by its construction admitting its being used either as an eccentric or concentric chuck.]

CARPET SWEEPER—H. H. Herrick (assignor to Lafayette Culver), of East Boston, Mass.: I claim first, Inclining or grooving the brush shaft as at o and k, as described for the purpose specified.

Second, I claim protecting the bearings from dust by means of the plates, l, m and n, operating in the manner described for the purpose specified.

Third, I claim the peculiar construction of the dust pan, with its spring lip, 5, in combination with the screen, t, operating as set forth for the purpose specified.

Fourth, I claim dividing the brush in the center, and connecting each half with one of the driving wheels, as set forth, in combination with the method described of pivoting the inner ends to a suspended support, as described, whereby the continuity of the brush is not interrupted as set forth.

SEWING MACHINES—T. D. Jackson (assignor to Joseph W. Bartlett), of New York City: I am aware that thread guides are used in single thread machines to convey the thread across the path of the needle, which receive their movements from mechanism other than the needle, an example of which may be found in the patent of O. L. Reynolds, May 14, 1850, and I therefore disclaim all such.

But I claim a swinging thread guide attached to the cloth presser, and operated by and in combination with an oscillating hooked or barbed needle, constructed substantially as described, whereby I am enabled to secure the taking of every stitch, and render a single thread machine effectual, as set forth and specified.

STEAM VALVES—Wm. S. Mackintosh and Samuel Wadsworth (assignors to Cridge, Wadsworth & Co.), of Pittsburg, Pa.: We claim the described arrangement of three hollow valves, B C C', with their stems and ports, and the passages in the valve box, the whole operating substantially in the manner set forth.

[A full description and engraving of this invention appears on another page.]

ADDOMETERS—L. N. Nutz, of Alton, Ill. (assignor to I. B. Randle and E. Hibbard), of Madison county, Ill.: I am aware that machines, with a series of circular indicators and a corresponding number of sets of keys have been made to effect the same purpose, but in these there were no means of connecting or disconnecting at pleasure the keys and the several wheels, so as to make the same set of keys register in turn the additions of the several columns.

I therefore do not claim, broadly, registering the result of the addition of figures in columns, by means of movable indicators acted upon by the keys of a finger board.

But I claim the feathered shaft, D, when combined and arranged with a series of indicators and a set of keys, substantially as above described, for the purpose of enabling the operator to add up and register any number of columns of figures in succession by means of the same set of keys.

STEAM COCK—J. L. Winslow, of Westbrook, Me., assignor to J. N. Winslow, of Portland, Me.: I do not claim the application of a screw directly to the shank or spindle of a valve in order to support the spindle during its rotary movements, and to move the valve either towards or away from its seat.

But what I claim is arranging the operating screws, b c, at the foot of the plug and its case, so as to be capable of being rotated therein, without at the same time having any longitudinal motion.

And I also claim making the spindle, F, separate from the plug E, and combining with them and the case, the bearing shoulder, m, and the clutch connection, the whole being substantially as described.

RE-ISSUES.

SKIRT HOOPS—David Holmes, of Westfield, Mass. Dated June 15, 1858: I claim first, Connecting the hoops to each other by a series of loops, substantially as specified.

Second, Attaching to the hoops the tapes or other articles by which the hoops are suspended by means of metallic clasps which embrace the hoops, substantially as specified.

Third, Forming eyes in the braiding at the extremity of the hoops to serve as a slide, substantially as specified.

WATCH CASES—W. E. Baldwin and E. Bliss, of Newark, N. J., assignees of John F. Watson, of St. John's square, Clerkenwell, England. Dated April 13, 1858. Patented in England June 16, 1857: We claim first, Attaching a pendant in double case watches permanently to the ring of the outer case, substantially as and for the purpose specified.

Second, Connecting the inner case with the ring of the outer case, so that the inner case containing the works on dial can be reversed and held within the ring of the outer case to exhibit either the back or the dial through the bizzle, and so that the inner case may be held in the ring of the outer case independently of the closing of the outer case, as set forth.

Third, In reversing the inner case containing the works and dial in the outer case to present the dial on either side, I claim shifting the dial one quarter of a circle substantially as described, or by equivalent means, so that the figures of the dial may be properly located relatively to the pendant for either the ordinary open face watch, or the ordinary hunting watch.

Fourth, Forming the ring of the inner case with a flange or rib, substantially as described, in combination with a corresponding flange, rib, or rest on the ring of the outer case, to give the required support to the inner case within the outer case when reversed, to present the dial in either direction, as set forth.

DESIGNS.

STOVES—Jacob Steffe, James Horton, and John Currie, (assignors to David Stewart and Richard Peterson,) of Philadelphia, Pa. Two cases.

ROLL PANS—Nathaniel Waterman, of Boston, Mass.

Hydraulic Cements.

We learn from *Galignani's Messenger* that an interesting paper on this subject has been submitted to the Academy of Sciences at Paris by M. Kuhlman, showing the advantage that may be derived from the combination of silicates with mortars and cements in general, and especially with those that are intended to resist the action of sea water. It is well known that the first effect of water on cements is that of forming hydrates, after which a gradual contraction takes place, producing a degree of hardness which increases in proportion as the contraction is slower, and there is more silica or alumina in the cement. Now M. Kuhlman has observed that if alumina or its silicate, or else magnesia, whether caustic or carbonated, be kneaded into a paste with a solution of silicate of potash or soda, the compounds resulting therefrom will bear a perfect resemblance to the natural silicates, such as feldspar, talcous shale, magnesite, &c., and will, by repose and slow contraction, become hard and semi-transparent, resisting in a high degree the corrosive effects of water. If slaked lime be added to the said compounds they acquire the properties of hydraulic cements. M. Vicat, Jr., having shown that calcined magnesia added to a cement would resist the action of sulphates of magnesia, M. Kuhlman has endeavored to turn this observation to account, by mixing calcined dolomites (which contain magnesia) with mortar, with the addition of alkaline silicates. This composition he finds very advantageous, since most of the salts contained in sea water must contribute towards the preservation of such cements.

In fact, the chloride of magnesium, as well as the sulphate of magnesia, will be decomposed, and form a layer of silicate of magnesia on the surface of the cement; in the same manner the sulphate of lime must, being in contact with the silicate of potash or soda, form the silicate of lime; and all the silicates strongly resist the action of sea water. As for sea salt, which is a chloride of sodium, M. Kuhlman proves that in the proportion in which it exists in sea water it will slowly decompose the silicate of potash contained in the cement, and leave the silica free. The compositions proposed have, therefore, the singular property not only of resisting the corrosive qualities of sea water, but of actually becoming more insoluble the longer they are in contact with it.

A cement composed of 30 parts of rich lime, 50 of sand, 15 of uncalcined clay, and 5 of powdered silicate of potash, is recommended by M. Kuhlmann as having the requisite hydraulic properties. In marine constructions care should be taken to add an excess of silicate to those portions of cement which are exposed to the immediate contact of the sea. M. Kuhlman is an old and valued correspondent of ours, and we are pleased to see that he is still devoting his profound chemical knowledge and ability, to the development of improvements having a practical and useful tendency.

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New Inventions.

Kahnweiler's Pipe Joint.

In the usual method of forming joints for tubes for the conveyance of gas, water, or steam, great difficulty is experienced in first making them perfectly tight, and subsequently keeping them so, and enabling them to be easily turned to the positions desired. The object of the plan of joint, which we illustrate below, is to remedy the defects of the old mode of connecting swivel elbow joints, and figure 1 of the engraving represents a section through a gas or other pipe, to which the improvement is attached; figure 2 is a detached view of the open end of ditto, and figure 3 is a perspective view of the metal washer surrounding the bolt for securing the elbow to the pipe.

Upon the end of a male section, A, of a joint, is cast an axial stem or rod, B, said stem projecting from a cross bar, C, which is cast with, and just within, the open end of the said section. This rod passes through the axis of the female section, E, of the joint, and through an aperture on the covered end of section E, beyond which it projects sufficiently to admit the washers and tightening nut, D, which is screwed on its end, one of the washers being of vulcanized india rubber, and the other of metal, of the shape indicated in figure 3, to fit the axial stem, which is squared on one side at this point, to prevent the washer from turning round when the joint is turned or swivelled. The face of the flange, G, is left rough, as it comes from the mould, and the faces of the female section are turned, so that very little work is required to make a joint of this kind air or water tight. A segmental pipe, H, extends from the female section, E, and communicates with another female section, arranged at right angles to the first mentioned one, and having a male section, I, attached to its open end by a rod or stem, J, and washers and nut, K, in the precise manner that the corresponding parts below are formed and fastened.

Fig. 1 Fig. 2

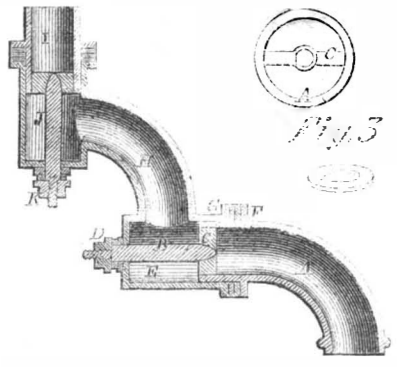


Fig. 3

Two washers, one of rubber and the other of leather, are placed between the flanges of the male and female sections of the joints, and the requisite degree of pressure to perfect the joints is given them by the tightening nuts, D, K. In this simple manner—a correct, reliable and efficacious universal joint is formed, capable of being easily moved in any direction, and without the expensive and difficult process in forming the usual conical joints heretofore employed.

The patent was issued on the 29th of June, 1858, and any further information can be obtained by addressing the patentee, David Kahnweiler, 55 North 6th st., Philadelphia.

New Corn and Cane Cutter.

This harvester is remarkably simple, and having been practically tried for some time, it has been found to answer remarkably well. The circular saws cannot fail to cut, and every stalk must fall except where the corn is flat upon the ground, but in such a case the rods which are mentioned in the following description raise it sufficiently high to be cut off. Its motion and work are rapid, there is very little gearing, and it will do its work with one horse and driver. The inventor states that it will cut from 50,000 to 55,000 hills per diem, four feet apart, taking two rows at a time. In drilled corn or cane, it will be thrown upon the ground in one continued unbroken line, and is, in this state, just as easily taken up and put in bunches or stacks, as if it were thrown in gavels, the cutting being the greatest and most laborious job. The machine can be put up and arranged to cut any distance from the ground, as circumstances may require.

BONWILL'S CORN AND CANE HARVESTER.

Fig. 1.

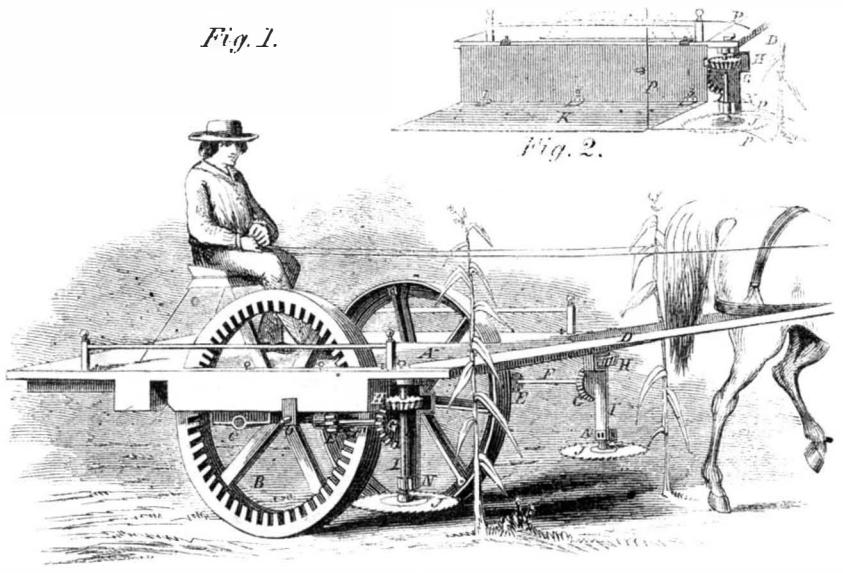


Fig. 2.

In the perspective view, Fig. 1, A is the platform, supported by the two driving wheels, B B. The axle, C, of driving wheels, and clamp box, being the supports. E are pinion wheels upon shafts, F F, working into main drivers. Upon the outer ends of shafts, F F, are beveled wheels, G G, giving motion to the beveled wheels, H H, attached to the upper end of shafts, I, upon which the saws, J J, are hung, supported by the iron brace, N, fastened firmly to the under side of framework. D are the shafts.

In Fig. 2, which is a detached view of the cutting apparatus and receiving platform, K represents a horizontal plate or bed, hung by three hinges, 1, 2, 3, allowing it to rise and fall. Upon this the stalks fall, and there is one upon each side of the machine. The stalks are deposited on the ground by a lever (not seen in engra vi ng), placed under the platform. P P are rods for guiding the cut corn on to the plate or bed, K, and also for raising the fallen corn.

Being unable to go into the manufacture of them, the inventor offers the right for sale, whether it is for States, or *entire*. For further particulars address the inventor, Wm. M. Bonwill, M. D., Camden, Del., who obtained a patent March 4th, 1856.

PUGH'S CAR WHEEL.

Fig. 1

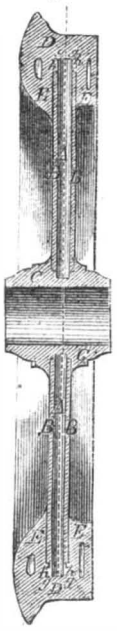
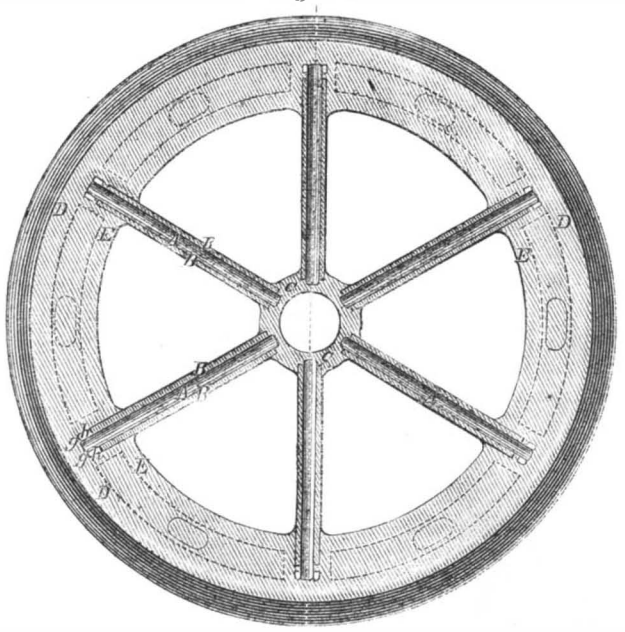


Fig. 2



The manufacture of car wheels when cast from one kind of metal and then chilled on the periphery, is attended with some difficulty, from the unequal contraction of the chilled portion and the unchilled part. To compensate for this, or rather to avoid these effects, John Pugh, of Nashville, Tenn., has produced the wheel which is the subject of our illustrations.

Fig. 1 is a vertical transverse section of one of these wheels, and Fig. 2 is a vertical longitudinal section of the same.

A are spokes of wrought iron, surrounded by corresponding hollow spokes, B, of the same material, the spokes, A, projecting beyond B at both ends. This unequal length brings the termination of A on a line with the inner portion of the segments forming the tread of the wheel, while the ends of the outer spokes, B, are brought within the circle of the segments forming the inner portion of the rim. This characteristic causes the extremities of the inner spokes to receive the shrinkage of the outer portion of the rim, D,. and the ends of the outer ones to receive the shrinkage from the inner portions, D, of the same, and thereby enables the contraction of the two parts in cooling to be independent of each other. In pouring the melted metal during the casting of the wheel, it is made to flow around the rounded ends of the spokes, A, in such a manner as to form a ridge or fillet, *g*, at this portion, which shall serve as a support, but at the same time leave a space *h*, around the ends, between said ridge or fillet and the solid metal connected with the inner portion of the rim, or segment next the ends of the hollow spokes, B, so as to allow the full and complete contraction of one portion without interfering with that of the other.

After the rim of the wheel has cooled, the hub, C, is cast within and around the inner ends of the spokes, A B, and by thus making this operation subsequent to the first, and after the outer extremeties have been permanently fixed, the pouring or cooling of the metal of the hub portion is prevented from affecting the rim.

The employment of the wrought iron spokes, A B, in the manner we have described, not only relieves the inner and outer cast portions of the rim of the wheel from all strain caused by the unequal contraction in cooling of the two masses of metal of different volumes, of which said inner and outer sections are respectively composed, but also enables the wheel to be made stronger and more durable than by the methods of manufacture now in use.

This method—patented by the inventor June 15, 1858,—is spoken very highly of by railway men. Any further information can be had by addressing John Pugh, (care of A. Anderson), Tennessee and Alabama Railroad Office, Nashville, Tenn.

Loss of Fuel in Furnaces.

In a paper read before the British Society of Arts, by Charles Sanderson, upon the subject of Iron, he remarked that although the blast-furnace is the most effective and also the most economical for reducing iron ore, yet we find that there is an actual loss equal to 80 per cent of the effectual usefulness of the fuel. This fact is arrived at from the theory which he laid before them of the formation of gases in the furnace, taking the melting point of pig-iron at 2,192 Fah. The fuel used, together with the blast injected into the furnace, will give the quantity of carbonic oxyd, light hydrogen, &c., which, when burned with heated air, would be sufficient to reduce or melt a given weight of iron from its ore, which in theory is estimated at between 16 and 17 per cent of the value of the fuel consumed. These gases, so largely produced, are now collected in many works by means of pipes variously arranged, and inserted a few feet below the mouth of the furnace. They are used mixed with a certain portion of atmospheric air, as a fuel for raising steam, heating the blast for the furnace, and (on the Continent) or the purpose of puddling; also for drying and carbonizing the ore prior to its being charged into the furnace. If these gases are taken as they arise from the furnace, he sees no objection to their being applied to useful purposes, but he does not object to even the least forcible means being used to draw them from it. No current ought to be created in any apparatus which may be formed for conveying these gases, since it would cause them to pass too rapidly through the furnace, and thus prevent them from producing their full effect upon the materials through which they are made to pass. This utilization of the waste gases is highly interesting, and presents a wide field for application, besides which there is an evident economy to be obtained from their use, provided they are properly withdrawn from the furnace.

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Death of an Eminent Man.

Count de Laradel, the proprietor of the lakes containing boracic acid, for which Tuscany is so celebrated, has died at Florence. The immense fortune he has left behind is the result of the profits realized from the extraction of the substance, for which he invented most ingenious and economical contrivances.

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Scientific American.

NEW YORK, AUGUST 28, 1858.

Progression.

Grand are the achievements of mankind, and noble are the deeds of mental heroism that adorn our race. Looking back upon what are called the triumphs of genius, we find them to be almost innumerable, and as great in the past as they are to-day; yet they go on still increasing in number as in usefulness, in magnitude as in permanent good.

An all-wise Providence has so constituted man's mental faculties that they know no rest, but are ever watchful and at work. The same great cause has also made man's wants—his necessities increase, so that the governing principle of both demand and supply is progression. This is illustrated in the newspapers of to-day. We have just made a glorious conquest over natural difficulties; the rising Orient has by human ingenuity been made to kiss the setting Occident, and the name of Cyrus W. Field is more elevated than was ever that of Cyrus the conqueror, Persia's king. The world gives him laudation, and mankind regards the success of the Atlantic cable with mingled reverence and heart-joy; but in the midst of all this due praise and earnest thankfulness, there comes from the daily newspapers a small suggestion, which we may briefly state as follows:

One cable will not be enough—we shall shortly want another

The daily press is the actual reflex of the national mind, and this, even in its moments of natural exultation, cannot forget the God-inspired principle of progression. The throbbing genius of human nature cannot be idle, but must let its pulse beat on some material substance, and it continues to improve, and shall continue to invent, until there is perfection—but there is no perfection yet. Many years ago, when Fitch's first steamboat steamed through the waters of the Delaware, or Fulton's *Claremont* passed between the beauteous shores of the Hudson, everybody was surprised, astonished! and some thought that they were indeed perfect; but we know their deficiencies, and there are now thousands of mechanics who could make a better steam engine than had then been seen. Let but the same period of time elapse, and the thousands of fire-breathing machines—locomotive, stationary, and marine—that we think so perfect and complete, shall appear clumsy, uncouth and imperfect; or, (who knows?) steam itself may be superseded, and some more economical motive power be used. The weekly records of the Patent Office also illustrate this progressive principle—improvement on improvement crowding on us, and yet their is room enough for all. We see one improvement crowding another in such rapid succession, that if to-day we exclaim, "how perfect," to-morrow we see an advance towards still greater perfection, so that in reference to the very best that *is*, we must also add, "but it is not the best that *can be*."

Many persons ask, almost in tones of fear, "to what is this impulsive and progressive spirit carrying us, and where are we going?" Our answer is the axiom—If the principle be good, then must its results be also! That which is honestly conceived, and truly carried out, must bring forth general, universal good; and he who puts into practice or forms original ideas is, in short, an inventor, whether of ideas or machinery—is a contributor to man's comfort, convenience, and elevation, and leaving the lower walks of life, he becomes raised to the dignity of a philanthropist.

Let us then carry out this idea—progression, exercising a judicious check that we do not run to extravagance; and as a community or nation, let us make use of each improvement as we originate it, and ever have for our motto—"Excelsior."

Watchmaking by Machinery.

There is no stronger evidence of the practical tendency of the minds of American inventors, than that exhibited in the constant devising and construction of machinery to fabricate articles of universal demand and use. It is not more than twenty years since clocks were exclusively furnished to us by European countries, and their manufacture here was almost unknown. Now, thanks to the inventive genius of our own mechanics, they are daily manufactured by thousands, through the instrumentality of machinery, which enables them to be constructed not only in a much superior and correct manner, but at one-twentieth the price originally demanded for them when manufactured by manual labor. The most ingenious machinery is now in operation for this purpose, in a few factories in the Eastern States, which not only supply all our own States with the most beautiful and correct household timepieces, but for upwards of twelve years past have been annually exporting them in large numbers to every corner of the world.

We some time since gave a casual notice of an extensive establishment in Waltham, Mass., for the manufacture of watches, upon the same principle, and by somewhat analogous machinery to that employed for the manufacture of clocks. Since that period this latter trade has been increasing in such a marked degree, as to leave no doubt that it will eventually rival, if not surpass, that of clock-making by machinery. The watch-making works were commenced by men of reputation and ripe judgment, who invested a large capital in the construction of the most delicate, costly, and ingenious machinery, to form and complete the respective parts of the watch; hence they are particularly careful that all the work leaving their hands shall be of the most perfect character. At the commencement of the enterprise, they very properly possessed themselves of all the available inventive ability and skill of the best mechanics, in simplifying the works of the watch and the construction of machinery for their fabrication. Dies of the most exquisitely delicate formation are employed for cutting the various wheels, as well as the other intricate parts, and lathes and polishing wheels for reducing the pivot jewels to the proper size, and giving them the proper finish. And while the simplicity observed in the construction of the watch lessens its liability to stop or otherwise get out of order, any cause of disarrangement is more easily detected, and the expense attending the repairs of more complicated watches avoided.

It is believed that a Waltham watch is worth double the price of many of the imported watches made by hand. In the event of any part of one getting out of order—as, for example, if a wheel or other part should break—it is only necessary to enclose the broken part to the factory through the mail, and by return post a perfect duplicate can be transmitted. The original intention of the gentlemen engaged in this important undertaking was to make a perfect and cheap article, and thus to establish it upon a firm basis; and our impression is, that this marked innovation of Yankee ingenuity upon the cheap labor of Geneva and other parts of Europe, will eventually result in the entire destruction of their export trade.

Gaslight on Cars and Boats.

We are informed that the New York Car and Steamboat Gas Company have applied their gas-lighting fixtures to the trains of the New Jersey Railroad with much success, and are now engaged in putting them into the cars of other roads. We have seen a certificate from the Vice-President of the New Jersey Railroad, in which he speaks in the highest terms of the success of the apparatus. He says: "The light is cheerful, bright and uniform, rendering all parts of the car distinctly visible, and much superior to the gloomy light furnished by candles and lamps. Its management is simple and easy, and free from the objections of other modes of lighting cars; and in point of economy, there is a saving of more than two-thirds the usual expense."

The locomotive head-lights are also of gas.

The method of applying and carrying the gas is as follows: Each car is provided with a wrought iron cylinder, of a capacity of four and a half cubic feet. The cylinder is of a strength capable of sustaining 500 pounds pressure. The heads, for greater security, are made concave. The gas is compressed under a pressure of twenty atmospheres (300 pounds to the square inch), 90 cubic feet of gas being forced into each cylinder. Each car is provided with a cylinder, which is placed upon a shelf under the car floor, and coupled in the usual manner, with a pipe leading to the burners within. An improved regulating contrivance controls the delivery of the gas to the burner under all pressures, and is interposed between the cylinder and burners, so that the light is always steady. The pressure of the gas ensures the continuity of light, no matter what the concussions or roughness of the road.

The method of charging the cylinders with gas, adopted on the New Jersey road, is simple and expeditious. Near the Company's machine shop at Jersey City, a stack of the cylinders are arranged, into which the gas is forced by the rapid movements of a steam pump, to a pressure of about 450 pounds. The cylinders are connected together by small pipes, and thus form a strong and capacious reservoir. A conducting pipe leads from the stack to the large depot on the Hudson river, where all the passenger cars arrive and depart, a distance of a quarter of a mile. The conductor terminates in a horizontal pipe running beneath the depot platforms, with stop-cock openings at suitable intervals. When the car cylinders are to be charged, an attendant simply couples them to the conducting pipe, and opens a stop cock. The gas then instantly rushes into the cylinders and fills them, under the pressure of the reservoir, and they are ready for use. The filling of the cylinders for a whole train occupies only a few minutes, and the work of supplying all the trains with gas is, we are told, easily performed, from beginning to end, by one man.

As developed on the New Jersey Railroad, the lighting of cars by gas seems to be a highly practical and economical enterprise. We presume that other companies will not be backward in its adoption. It would also seem that gas companies, by providing proper pumps for filling the cylinders, might find an extensive use for gas in country churches and dwellings. It is said that the gas may remain confined within the cylinders for any length of time, unimpaired. A single cylinder of the dimensions before named, would supply a country family with gaslight for a week.

Extraction of Gold from Dross.

It is a singular fact that notwithstanding the large number of able mechanics that have emigrated to California, to engage in the development and extraction of its golden wealth, but few of them have produced any important inventions to assist their labors. Those who have had experience in gold digging have represented to us that miners have found great difficulties for the want of some process, by machinery or otherwise, in extracting the gold from the extraneous substances with which it is intermingled. In consequence of the neglect of inventors and mechanics to provide some quick means for the accomplishment of this object, particularly in the extracting of the gold from the heavy black sand or iron oxyd with which it is found, a large amount of the combined mass is thrown aside as a refuse substance, although known to be rich with the precious metal. The Sacramento *Union*, in a late article on this subject, notices a method of extracting gold from what is termed as the "tailings" of the quartz mills, invented by a Frenchman named J. B. Chavelier, at present residing in Sacramento. These "tailings" are the sulphates, chiefly of iron, which, after pulverizing, are rejected in the amalgamating process, and thrown out generally as worthless by the miners. He found them to contain from fifty to one hundred cents of gold to the ounce of sulphate, and succeeded in bringing his machine to such perfection as to enable him to work over a tun of the quartz waste per day, from which is yielded an average of $100 per tun—one thousand dollars being sometimes extracted from this material, which costs only thirty dollars in its almost refuse state.

In addition to the sulphates, a considerable amount of mint and assay ashes are subjected to the searching process. But a larger business still is done in the black sand procured either directly from the miners' camps, or from the bankers, who obtain it in cleansing the dust they purchase. These "blowings," as they are denominated, are sometimes very rich, yelding as much as $210 upon fifty-seven ounces of sand. The use of the sulphate does not end with the surrendering up of its golden richness, but it is sold at three cents per pound, and converted into a common article of paint, which, after passing through the mill, is of a violet color.

The Helypsometer.

On page 323 of the present volume of the Scientific American, we gave a description of this instrument, and a few days ago we had the pleasure of seeing it practically tested in the presence of Professor A. D. Bache. The tests were two observations which had been taken with this instrument by Captain Foster, on board the *Marion*, from New York to Charleston. The Captain also took observations with his sextant, and by that means obtained the latitude. This being known, the question was whether the helypsometer would give the same latitude, and on opening it (for it had been sealed up), and the necessary simple observations and calculations made, the latitude was found to differ only from two to four minutes of a degree from that formed by the Captain's sextant. This is as near as any two observers with sextants or quadrants on the deck of the same vessel could make the observation, and is a much nearer approximation to exactitude than was ever obtained by any instrument that has been used to obtain latitude when the natural horizon was obscured.

The instrument will prove very valuable in the foggy regions of Newfoundland and the coasts of Great Britain, and does much credit to the inventor, Mr. John Oakes, of this city, who has secured it by Letters Patent in this country and in Europe through the Scientific American Patent Agency.

Steam on Canals.

We observe that many of our cotemporaries are publishing the results of the application of steam power to certain canal boats on the Erie Canal, in such laudatory terms as to indicate that such a thing had never before been accomplished. We would remind all those who labor under this delusion that the practicability of steam as a motive power on canals was long since determined, and that boats propelled exclusively by steam and capable of carrying larger cargoes than those of the ordinary form have been successfully running on the Delaware and Raritan Canal for many years. The difficulties originally encountered in the washing of the banks from the waves produced by the propelling power have been entirely avoided in the methods adopted in this case, and the boats are moved with a much greater degree of speed than by horses, and at a much less expense. The practicability of steam canal navigation was therefore a fixed fact long before the late experiments were tried.

To the Postmasters of the United States.

Please to inform all the inventors in your town and vicinity, that the Editors of the Scientific American have issued an elaborate circular, giving instruction how to secure Letters Patent for new inventions, which they send free to all who may desire a copy. Their great experience for thirteen years past in procuring patents enables them to give the best possible advice upon this subject.

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THE ATLANTIC TELEGRAPH.

On the evening of the 16th, the people of the United States were startled by the intelligence that the Queen's message had been received. Crowds assembled round the bulletin boards, and the news spread like wildfire. The President immediately sent his reply.

Considerable disappointment was felt, however, in the first instance, caused by a portion only of the message of Queen Victoria being sent, but on the following day the succeeding paragraphs were received, and the annexed telegram from the electrician to one of the Honorary Directors of the Company affords a full explanation:—

TRINITY BAY, August 17, 1858.

R. M. ARCHIBALD, New York—

The Queen's message was completed at five o'clock this morning. It was commenced yesterday, and during its reception Valentia desisted sending it, in order to make some slight repairs in the cable. Through a mistake, the part received was sent south as if it constituted the whole message.

DE SANTY.

THE ROYAL MESSAGE.

TO THE PRESIDENT OF THE UNITED STATES, WASHINGTON :—

The Queen desires to congratulate the President upon the successful completion of this great international work, in which the Queen has taken the deepest interest.

The Queen is convinced that the President will join with her in fervently hoping that the electric cable which now connects Great Britain with the United States will prove an additional link between the nations, whose friendship is founded upon their common interest and reciprocal esteem.

The Queen has much pleasure in thus communicating with the President, and renewing to him her wishes for the prosperity of the United States.

THE PRESIDENT'S REPLY.

WASHINGTON CITY, August 16, 1858.

TO HER MAJESTY VICTORIA,

THE QUEEN OF GREAT BRITAIN :—

The President cordially reciprocates the congratulations of her Majesty the Queen, on the success of the great international enterprise accomplished by the science, skill and indomitable energy of the two countries.

It is a triumph more glorious, because far more useful to mankind, than was ever won by conqueror on the field of battle.

May the Atlantic Telegraph, under the blessing of Heaven, prove to be a bond of perpetual peace and friendship between the kindred nations, and an instrument designed by Divine Providence to diffuse religion, civilization, liberty and law throughout the world.

In this view, will not all nations of Christendom spontaneously unite in the declaration that it shall be forever neutral, and that its communications shall be held sacred in passing to their places of destination, even in the midst of hostilities?

JAMES BUCHANAN.

Mr. De Santy, the electrician-in-chief at Trinity Bay, says that he is unable to give any information for publication as to the working of the cable, but that the time necessary for the transmission of the President's message depends on its length and the condition of the line and instruments at the time—perhaps, under favorable circumstances, an hour and a half. The reception of the Queen's message was commenced early one morning, and not finished until the next, but it was stopped for several hours to allow of repairs to the cable.

On the evening of the 17th, New York and many other cities were brilliantly illuminated, fireworks were let off, and the people generally had a good time of it throughout the country; and here, to celebrate the event properly, the cupola and upper story of our City Hall was burned, doing damage to the extent of $50,000.

The United States steam frigate Niagara, Capt. Hudson, anchored outside the bar of New York Bay, early on the morning of the 18th, and arrived off the Battery at half-past 4 P. M.

The Niagara, after having successfully laid her portion of the first Ocean Cable, arrived, as we already know, at St. John's, N. F., on the 9th, and sailed thence for this port on the evening of the 11th inst. Her long passage is to be attributed to an inadequate supply of coal, as well as to the inferior quality of the supply she had on board. She has arrived at this port with all her paying-out and other machinery on board. The several platforms and stagings on deck, the massive wheels over which the cable was reeled out, and the protecting guards around the stern are still there. The circles in which the cable was coiled remain the same. In two of the circles are coiled the surplus cable in its original flakes—in all, about one hundred miles.

There are reports current that this surplus cable has been already sold for $400 a mile.

The Niagara remained at anchor off the Battery for about an hour, waiting for the ebb tide in the East River, and arrived at the Navy Yard about seven o'clock.

The Gorgon, the Niagara's attendant in laying the cable, has not arrived. She was waiting at St. John's for orders from England.

Mr. Cyrus W. Field came to this city from the Niagara in the steamer Achilles, and proceeded immediately to his home. Captain Hudson went ashore at half-past 7 o'clock P. M., and proceeded to the Mansion House, Brooklyn, where he was publicly received.

Mr. Field describes the feeling which pervaded all on board the Niagara while the cable was being laid, as one of the most intense excitement. Every man exerted himself to the utmost to achieve success in the work. Throughout the six and a half days the most perfect silence and attention pervaded the men, lest a single moment of negligence should destroy the cable. On the first day after the paying-out began, it was found that the cable was being payed out at a rate which, in proportion to the distance run, would, if continued, have defeated the enterprise. This was owing to the fact that the cable on the Niagara had caused so much local attraction as to seriously derange the compasses, rendering it impossible to steer the ship. Next day, Commander Dayman, of the Gorgon, being apprised of the fact, ran ahead of the Niagara, steering in the most direct course for Trinity Bay. This he continued to do day and night until they arrived, never leaving the deck unless for a few moments, and verifying his position by repeated observations of the sun, moon and stars.

When his arduous task was accomplished, his eyes were swollen and suffused with blood, from long loss of sleep, and he was almost prostrated from the immense fatigue he had undergone. Without his assistance the cable would have been exhausted long before the Niagara reached land, and to his agency, therefore, the success of the achievement is largely indebted.

The scene at the landing of the cable must have been intensely exciting. When day broke, the boats were all lowered, and 1,300 fathoms of cable were carried ashore. First Lieut. James H. North handed the shore end to Capt. Hudson, who placed it on the beach. A procession was then formed, headed by Captain Hudson and Mr. North, followed by the officers of the Niagara, captains of the Gorgon and Porcupine, their officers, crews, and the crew of the Niagara. Each taking hold of the cable, they marched up from the beach to the telegraph station-house, a distance of half a mile, where they deposited the end of the cable. Captain Hudson then offered prayer and a few remarks appropriate to the occasion, when the ceremony of landing terminated. The officers and crews then returned to their respective boats, reaching their vessels at six o'clock in the morning. The Gorgon and Porcupine carried the American flag at the fore, the Niagara the English flag at the fore, and the telegraph flag at the mizzen.

The Agamemnon telegraphed at 1 P. M. on the same day (Thursday, August 5) that *she had landed her end of the cable.* On the announcement of this fact, the Gorgon fired a salute of twenty-one guns, and her crew, manning the rigging, gave three hearty cheers, which were as heartily returned from the Niagara.

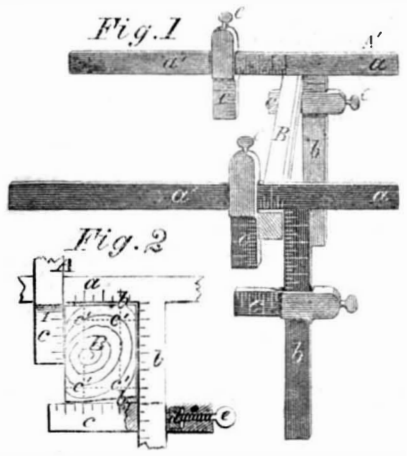
During the whole voyage "there was but one man on board," says an officer, "who was sanguine, and even confident, of success; and he was Mr. Field. He seemed almost certain of success, when none others dared to hope lest they should be disappointed."

Of Mr. Everett, the same officer says: "Even he had but little confidence of success, but to him is the triumph due. Without his skill the cable must have snapped."

From East and West and North and South, congratulations pour in upon the gentlemen who have so nobly brought this great enterprise to a successful issue; and we are glad that the first use to which the cable has been put, has been the transmission of words of peace, fellowship and good will, between the old and new worlds.

The English newspapers brought by the steamship Arabia, note the arrival of the Agamemnon at Valentia Bay, and are all exultant that the cable is laid.

Hoke's Improved Marking and Winding Square.



The object of this invention is to obviate the difficulty and trouble attending the squaring of timber by means of the usual straight-edges, and not only ensure the accurate marking or lining off of the timber or logs, but also to expedite the work to a very considerable degree.

Our engraving shows the invention, Fig. 1 being a perspective view of the square applied to a stick, and Fig. 2 an end view of the same.

A A′ represent two squares which may be constructed of steel or wood, and properly graduated on each arm, *a′ b*, into inches and fractional parts. The arms, *a′*, of the squares may extend a certain distance beyond *b* as seen at *a*, so that these portions may serve as counterpoises and retain the squares upon the stick or log before they are secured to it, as will be described. On the arms, *a′ b*, of each square, a slide, *c*, is placed. These slides are merely straight bars, having a mortise or rectangular opening made through one end to allow the arms, *a′ b*, to pass through, and a spring or any elastic substance, *d*, in the mortise, so that by a screw, *e*, they can retain *c* on *a′* and *b*, without abrading the edge or surface. The arms and slides are graduated to correspond with each other.

The device is used as follows:—Suppose a log of winding or irregular form, B, is to be marked that it may be hewed square, it is propped up or supported in any proper way, and a square, A, is placed on each end of the log as in Fig. 1. The operator then takes sight over the two squares, and if they are not in the same plane, one or both squares are wedged or raised at either side until they are both brought in the same plane. The wedges are shown at *b′*. The slides, *c*, are then moved on the arms, and brought in contact with the log and secured against it, by means of the set screws, *e*. The two squares being adjusted or brought in the same plane by means of the wedges, holes are pricked in the log at each side at corresponding distances, which are ascertained in consequence of having the slides and arms of the squares graduated; for instance, if a prick is made in one side of the log at the inch mark on the slide, a prick is made in the opposite side of the log at a corresponding point designated by the inch mark of the arm, *b*, each end of the log is pricked in the same way, and the squares are then detached from the log, which can be readily lined from marks previously made. These pricks will be seen at *c′*, Fig. 2. This device may be used not only for marking off square timber for all kinds of framings whatever, but also for marking off rough hewed logs for counter-sawing. It will be seen at once that there is a very appreciable advantage attending the use of this device over the common method by the straight-edge, for the work can be marked off at once expeditiously and accurately.

It is the invention of Joseph Hoke, of Grand de Tour, Ogle county, Ill., by whom it was patented Dec. 29, 1857, and from whom any further information can be obtained.

Trial of Breech-Loading Carbines.

The following is the result of the match, shot with breech-loading carbines of their own invention, between Lieut. Symmes, United States Ordnance Corps, and Mr. Gibbs, of New York.

In May last a match was shot by the gentlemen above named, inventors of breech-loading carbines, to test the relative merits and accuracy of their respective weapons.

We perceive by Boston papers of last week, that the umpire has made his report, and awarded the disputed target, at 600 yards, and the stakes, $200, to Lieut. Symmes; and as it was near sunset of the last day set apart for the trial, he withdrew from the contest at 300 and 100 yards, and conceded to Mr. Gibbs the amounts respectively staked for these distances.

The Lieutenant beat his opponent, in a string of 100 shots at 600 yards, over sixty feet.

The same parties met again, says a Boston cotemporary, at West Point, at the recent trial of breech-loaders there, and Lieut. S. beat Mr. Gibbs even worse than at Watertown. In fact, it is stated that Lieut. Symmes made the best target, Poultney & Smith the second, Burnside third, and Maynard fourth.

The Commissioner of Patents.

The present incumbent of this responsible office, Mr. Holt, has "won golden opinions" from the inventors of our country during the brief term of his official career. The principle enunciated in behalf of the rights of inventors in his famous decision in the Goodyear india-rubber case has attracted much attention.

Samuel L. Denny, an enthusiastic inventor residing in Pennsylvania, writes to us, proposing that all the inventors who receive Letters Patent during Mr. Holt's term of office, should each deposit the sum of one dollar in the hands of Munn & Company, to constitute a fund wherewith to purchase and present to him a superb testimonial upon his retiring from the office. We have no doubt should this proposition be fairly presented to such patentees that it would meet a most hearty response. Mr. Holt, however, we imagine, has no taste for any such demonstration, and in regard to ourselves, we should not desire to become responsible for any sums of money not intended for our legitimate business.

PREPARATION FOR THE HAIR.—The French are not only remarkable for their inventive genius, but also for the direction it sometimes takes. A manufacturer in the south of France advertises a preparation which he calls *Eau de Noblesse*, and declares that it makes the hair always preserve an "honorable" direction, and gives to the person who uses it an "air of distinction and supremacy."

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Correspondents

C. I. H., of R. I.—The experiment has been tried of putting one wheel loose on the axle of a railroad car to overcome the friction on the curves. We have never heard of any special objection to this method, although we understand that arrangements analogous in their operation are liable to throw the cars from the track.

I. E. S., of Md.—If a patent has been secured in the United States for an invention for an old device that had been long before used in a foreign country, upon such being brought forward on trial, the court would dismiss the case, and the patent would be useless.

I. F. H., of Me.—We know nothing of the nature of Mr. Hudgin's receipt, as he has not communicated this information to us. We cannot be presumed to know the character of all the articles advertised in our columns, although we mean to use all proper vigilance to protect our readers against imposition. Mr. Hudgin can be called upon, by those who propose to purchase his receipt, for vouchers as to his standing and character.

L. W., of Ct.—You are no doubt correct in your ideas in regard to the sun-dial and needle. The combination is very old.

J. M., of R. I.—We thank you for your kind allusion to our Patent Agency in your case. We always do the best we can for our clients—and it is quite certain that if we cannot succeed, there is not much chance elsewhere.

A. S., of Conn.—Good ink will never become mouldy, but we should advise you to add a few crystals of copperas to yours, as there is evidently too much gall.

W. B. S., of Pa.—You can only relieve your salt well of gas by digging a supplemental well some distance from the other, and tunnel between them, so that the brine can flow into the supplemental well from which it can be pumped, and the gas can escape from the brine well. The supplemental well need only be a few feet in depth below the surface of the brine.

Frederick Kesler, of Great Salt Lake City, Utah, wishes to correspond with some party who can furnish the best wheat washer and dryer, a machine capable of washing and drying the wheat in a very short time ready for the stones.

P. P., of Mass.—We are sorry that you have been deceived in referenee to the man who advertised, in our columns, to re-point gold pens. You say that you "had no thought of making us a party to the humbug, as you have for years been in the habit of associating with us a peculiar reliability." This is very complimeutary, certainly. Ever since we became connected with this paper we have labored industriously to make it in every way reliable, but we cannot always determine the character of our advertisers, although we can usually decide on the propriety of publishing matter which they wish inserted. Plaster of Paris mixed with water is the substance generally used to affix the common metallic tops to the glass lamps.

H. A., of Ala.—You can make an approximation to the amount of alcohol in wine with an hydrometer, but the only accurate way is by distillation. Home made wines generally require some spirit, such as brandy, to be added, to keep them for any length of time.

T. F. of N. Y.—If you attached a sliding horizontal arm to a vertical rod, and desired to force the arm down by means of a weight, you would place the weight on the arm close to the vertical rod, and not at its extreme end; for the latter position would cause the arm to hug the rod, and thus retard its descent. The exercise of a little reflection will enable you to see this. We have no doubt that impure water is often a cause of fevers and other diseases, and that it is a good plan to purify it by sinking a barrel filled with charcoal and perforated with holes, so as to permit the disenfectant to act upon the water. This has often been done, though, perhaps, not in the same way. We were not aware, before you mentioned it, that a barrel of charcoal would answer this purpose for two years. We did not say that lightning never went from the earth to the clouds; we said "seldom." It is still a matter of opinion whether or not it is a common occurrence as you seem to think it is.

W. R. W. of Boston, H. O. A. of N. O.—We thank you for your complimentary allusions to the vigilance of the Scientific American Patent Agency, as shown in your case. We are successful in getting patents for many meritorious inventors, after their cases have been rejected through mismanagement by other hands. Inventors who employ our agency can always depend upon fair, candid and earnest attention.

A. T. M. of N. Y.—We are not aware of a second edition of "Piesse's Art of Perfumery." The article noticed by you in the Scientific American, from the pen of Mr. Piesse, are sent directly to us by the author. We are glad to hear that our paper is so well liked among your people, and hope the number of admirers will increase on the new volume. If all our friends would only lend us a little of their time, we should have a larger list than at present.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, August 21, 1858:—

W. H. C., of Wis., $45; P. S. C., of Ill., $25; E. S., of Texas, $55; G. M., of N. Y., $30; L. B. T., of Conn., $32; B. S. M., of Iowa, $25; S. M., of N. Y., $35; W. R. C., of Iowa, $30; W. H., of N. Y., $30; A. C., of N. Y., $31; C. N. S., of Conn., $30; S. C. H., of N. Y., $55; J. L. B., of N. Y. $30; M. & B., of N. Y., $30; W. S. W., of N. Y., $20; A. S., of Pa., $25; W. H. T., of Mass., $25; A. C. B, of Mo., $30; J. A., Jr., of Mass, $25; M. K., of N. Y., $30; F. S., of N. Y., $40; S. S. T., of Ind., $25; P. W. G., of Ill., $20; J. B. of Mass., $25; J. A. B., of Fla., $34; L. S. C., of N. Y., $30; J. W. C., of Ind., $25; M. & McL., of Ga., $50; G. B. C., of N. Y., $30; T. S. E., of Ind., $15; J. C. M., of Mich., $30; H. N. B., of N.Y., $20; C. B. C., of R. I., $55; A. P., of Mass., $30; J. C. A., of Ohio, $25; P. P. J., of Pa., $30, J. B., of Ill., $25; H. S., of N. Y., $30; J. B., Jr., Mass., $30; J. & R. McM., of N. Y., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, August 21, 1858:—

P. S. C., of Ill.; A. F. T., of Mass.; M. K., of N. Y.: J. C. A., of Ohio: O. L. C., of Ill.; A. S., of Pa.; J. B., of Ill.; J. A. B., of Fla. (2 cases); J. W. C., of Ohio; A. D. B., of N. Y.; J. R., of Mass.; E. C., of N. Y.; S. S. T., of Ind.; M. & W., of Ind.: J. A. Jr., of Mass.; W. H. T., of Mass.; C. C., of Miss.

Literary Notices.

The Eclectic Magazine.—W. H. Bidwell, Editor, 5 Beekman steeet, New York.—The August number of this interesting periodical is full of well selected articles, carrying the reader's mind through the sciences of space, landing him in the field of romance, in the 144 pages which compose a single number. "Lieut. Maury's Geography of the Sea," "From Delhi to Cawnpore," and "The Romance of History," are, in our estimation, the best articles.

The Eclectic Medical Journal.—R. S. Newton, M. D., Cincinnati.—We do not especially believe in eclecticism as a system of medicine, but we do believe in this journal, for in it every subject that its contributors handle is treated in a plain, practical, commonsense way.

Valuable Hints to our Readers.

It is well known to all our readers that we employ no traveling agents.

In order to become a subscriber to the Scientific American, enclose the money in a letter, and address it to Munn & Co., 128 Fulton street, New York City. We depend upon our friends to aid us in getting subscribers and forwarding the names.

The safest way to send money is by a draft or check made payable to our order. It is more sure of reaching us than when sent in bank bills.

If bank bills are sent, we will assume the risk of them reaching us, when subscribers preserve a description of the bills, and take a Postmaster's receipt to show that the money has been mailed.

Many letters sent to us are without Post-office address or signature, and therefore cannot be answered.

When you order the Scientific American, be careful to give the name of the Post-office, County, and State to which you wish the paper sent. And when you change your residence, and desire your paper changed accordingly, state the name of both Post-offices—where you have been receiving it, and where you wish it sent in future.

CRIDGE, WADSWORTH & CO., MANUFACTURERS of Improved Patent Oscillating Steam Engines.—After a thorough practical test for over three years, of the above improvement, our success warrants us in offering it to the public, as securing what has been long needed for oscillating engines—a plain, simple, and durable valve, and constituting an engine unsurpassed for economy of fuel, simplicity of construction, compactness and durability. Its simplicity of style, with its compactness, gives it an unrivalled claim for cheapness, enabling the manufacturer to construct at one-half the cost of any other engine of the same value.

We have recently added a variable governor cut-off, cutting off the steam at any point, from the fourth of a stroke to nothing, as the work to be done requires, securing all the advantages claimed for this class of improvements.

Believing that they need only to be known to be adopted, we offer shop, county and State rights for sale on reasonable terms. Also one-half the patent for Great Britain. Circulars, with testimonials sent, by mail ou application to

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Pittsburg, Pa.

STEAM ENGINE—A NEW FIFTY HORSE power, suitable for a propeller, will be sold cheap. Can be seen at at 47 Maiden lane, New York City.

WOODBURY'S IMPROVED WOODWORTH Planing, Tonguing and Grooving Machines, are warranted to be vastly superior to any other machines in this country. When exhibited, they have always received the highest premium. Two gold medals have been awarded. Six patents have been granted to secure the improvements on these machines.

All sizes constantly for sale, by JAMES A. WOODBURY, 69 Sudbury street. Boston.

PECK'S PATENT DROP PRESS—ALL sizes, used for stamping copper or tin wore, silver ware ornaments, spoons, &c., and for forging gun work, lock work, carriage clips, &c. Also power and foot punching presses, and oval die chucks. Manufactured by MILO PECK & CO., 3 Whitney avenue, New Haven, Conn.

SWANEY'S PATENT PREMIUM WASHING Machine is the only machine ever patented that will take the place of the hand wash-board. Articles washed by it require no hand rubbing, as every part is washed perfectly clean. Great inducements are offered experienced and reliable men to sell territory for this machine. State and County rights for sale. Address C. M. SWANEY, Richmond, Ind.

TO INVENTORS.—I WANT TO PURCHASE, for use in the "Industrial Museum," one complete Operative Machine, of every improvement patented within the last two years.

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No. 5 Washington st., Boston.

RIVETS.—IRON BRIDGE, SHIP GIRDER, Boiler, Tank, Tender, Gasometer, and Stove Rivets.

Railroads, Locomotive and Machine Shops, Gasometer Manufacturers, &c., supplied with every kind of rivet used in the trade.

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MECHANICS' GUIDE—A PRACTICAL BOOK of tables, recipes, &c., for the use of mechanics and others. Sent free on receipt of 10 cents.

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TO MACHINISTS, IRON FOUNDERS, &C.—The subscribers offer for sale a second-hand Engine and Boiler, five horse power, second-hand slide lathes and blowers, of various sizes, all of which are in good order, and will be sold at low prices. For particulars in regard to them, apply to

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FIFTH EDITION—CATALOGUE CONTAINing 250 illustrations of Mathematical, Optical and Philosophical Instruments, with attachment of a large sheet representing the Swiss instruments in their actual size and shape, will be delivered, on application, to all parts of the United States, by sending 12 cents in postage stamps. C. T. AMSLER,
No. 635 Chestnut st., Philadelphia.

1858. NINTH EXHIBITION OF THE CHICAGO MECHANICS' INSTITUTE. The Ninth Exhibition of American Manufactures and Mechanic Arts, under the direction of the Chicago Mechanics' Institute, for the promotion of the Mechanic Arts, will be opened at Chicago on Saturday evening, September 4th, and continue to Friday evening, September 17th, 1858. As there is to be no Fair by the Cook County Agricultural Society this fall, premiums will be offered for farm products by request of the Agricultural Society, the list of which will soon be made out. For circulars or any further information, apply at the reading room or by letter to

LEWIS DODGE, Secretary.

CROSSETT'S PATENT STAVE CUTTER—Patented July 1, 1844; re-issued March 2, 1858; renewed and extended June 26, 1858. The above mentioned machine is warranted to cut more and better staves than any other machine in the United States, and is the most simple, cheap, and durable. I hereby caution all persons against using and vending said machine (the main features of which consist in the stationary knife and vibratory bed-piece) without the legal right to do so. Offenders will be dealt with according to law. All persons wishing an interest in the extended term of said patent can obtain it by addressing the undersigned at Joliet, Ill.

GEO. E. CROSSETT, Assignee.

MAGIC LANTERNS FOR SUNDAY SCHOOLS and Public Exhibitions.—A priced and descriptive catalogue of Lanterns and Sliders (with full instructions for exhibiting the Lantern), furnished gratis, and sent by mail, free of charge, to all parts of the United States.

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GUILD & GARRISON'S STEAM PUMPS for all kinds of independent steam pumping; for sale at 55 and 57 First street, Williamsburgh, L. I., and 301 Pearl street, New York.

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J. & WM. W. CUMBERLAND'S IMPROVED Patent Metallic Oil, for machinery and burning. Warranted to last longer than sperm oil. Manufactured only by the New York Cumberland Metallic Oil Works, foot of East 24th st. Office, No. 205 Broadway, New York. Under the inventor's superintendence. N. B.—See that our brand "New York Cumberland Metallic Oil Works, foot of East 24th street," is upon every package, however small.

WARTH'S SELF-ACTING WOOD-TURNING LATHES.—The best and most practical now in use; one boy will accomplish the work of four men. State and County rights for sale. Address A. WARTH, care W. H. Bertling, 23 Chambers st., New York, or the manufacturers, who have machines of all sizes on hand. Also a general assortment of machinists tools. Circulars sent. Address CARPENTER & PLASS, 479 First ave., New York.

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PORTABLE STEAM ENGINES.—S. C. HILLS, 12 Platt street, New York, offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, suitable for printers, carpenters, farmers, planters, &c. A 2½ horse can be seen in store; it occupies a space 5 by 3 feet; weight, 1,5 0 lbs.; price, $240. Other sizes in proportion.

THIRTIETH ANNUAL FAIR OF THE AMERICAN INSTITUTE at the Crystal Palace, in the city of New York.—The Managers announce that the Exhibition will be opened on Wednesday, the 15th day of September next. The Palace will be prepared for the reception of goods on and after the 7th of Sept. Machinery and heavy articles will be received and stored after the 1st of July. This exhibition is intended to embrace Machinery and New Inventions, Manufactures of all descriptions, and Agricultural and Horticultural Productions of every kind. Gold, silver and bronze medals, silver cups, and diplomas will be awarded on the report of competent and impartial judges. The Managers would impress upon exhibitors the importance of making early application for the space they wish to occupy. Circulars containing full particulars can be had by applying to WM. B. LEONARD, Corresponding Secretary of the Institute, No. 351 Broadway, New York, to whom all communications should be addressed. By order of the Managers,

F. W. GEISSENHAINER, JR., Chairman.
JOHN W. CHAMBERS, Secretary.

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MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise, at our warehouse. NEW YORK BELTING AND PACKING COMPANY. JOHN H. CHEEVER, Treasurer, No. 6 Dey street, New York.

These machines have no rival.—[Scientific American.

WHEELER & WILSON'S SEWING MACHINES, 343 Broadway, New York, received the highest premiums awarded in 1857 by the American Institute, New York; Maryland Institute, Baltimore; and at the Maine, Connecticut, Illinois, and Michigan State Fairs. Send for a circular containing editorial and scientific opinions, testimonials from persons of the highest social position, &c.

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Boston, Mass.

SLIDE LATHES, IRON PLANERS, UP right Drills, Slotting and Boring Machines, Universal Chucks, and a large assortment of machinists' tools, at greatly reduced prices. Address CHARLES H. SMITH, 135 North Third st., Philadelphia, Pa.

BELTING AND PACKING—Niagara Falls Paper Manufacturing Co., Niagara Falls, April 20, 1858. United States Gutta Percha Co.: We duly received the Gutta Percha Belting ordered from you, and after giving it a thorough test the past winter, on our heaviest engines, constantly exposed to water, ice and oil, and making 140 to 160 revolutions per minute; and again on two of our largest "Gwynne Pumps," making from 600 to 700 revolutions per minute, they have given us entire satisfaction, and we think it decidedly the best belting we ever used, and you may look for our future orders as required. S. PETTIBONE,

Treasurer and Superintendent.

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TO IRON FOUNDERS AND PIPE MANUFACTURERS.—I will sell the right to use and furnish the best Core Bars extant, for molding all kinds of Green Sand Cores on a hollow bar, for three-inch pipe and upwards. GEO. PEACOCK, Dalton, Ga.

ENGRAVING ON WOOD AND MECHANICAL DRAWING, by RICHARD TEN EYCK, Jr., 128 Fulton street, New York, Engraver to the Scientific American.

EVERY MILLWRIGHT, ALL MILL-OWNERS, and those interested in hydrodynamics, should become acquainted with the merits and principles of the improved Fourneyron Turbine Water Wheel, or the "Universal Turbine," a wheel the most economical in the use of water, and giving the highest percentage, with a partially raised gate, of any yet discovered. It gives from 75 to 97 per cent of power, according to the size of wheel and head employed. For information address S. K. BALDWIN,

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IRON PLANERS AND ENGINE LATHES of all sizes, also Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address "New Haven Manufacturing Co., New Haven, Conn."

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Science and Art.

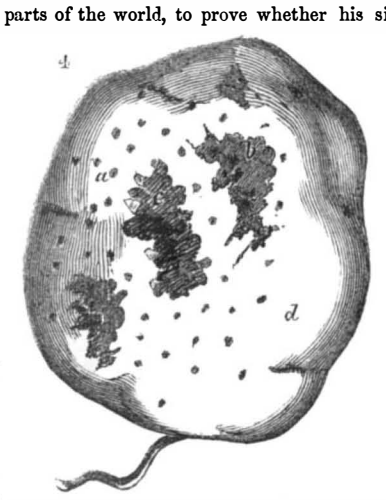
The Potato Rot--Its Cause and Cure.

This famous esculent—the most agreeable and nutritious vegetable which decorates the Celtic table or the American board, which is to the Irish peasant what corn is to the Western emigrant—has been for some time subject to a dire disease, emphatically known as the Rot. Both here and in Europe the potato crop pays remarkably well, in good seasons here an acre of land producing 400 bushels of sound potatoes, which, at fifty cents a bushel, give $200 per acre as the result of a year's farming. When we consider the vast extent of land which is thus planted, we can easily conceive the enormous interest that depends upon a healthy and good crop, and as in the last few years the rot has been increasing in geographical extent, it becomes excessively important to discover its cause. In the year 1805 the *Annual Register* published an account of the disease, and attributed it to a small insect called the *Aphis*, and it stated that "in some years the aphides are so numerous as to cause almost a total failure of the hop and potato plantations; in other years the peas are equally injured, while exotics raised in stoves and greenhouses are frequently destroyed by the depredations of these insects."

From that time until 1846 this disease received but little attention; but when in that year a whole nation was pauperized by the failure of the potato crop, and thirty thousand fellow human beings died of actual starvation, it became necessary that men of science and friends of humanity should endeavor to discover the cause of this dire calamity, and to prevent its recurrence. These patient investigators set to work, and many avowed their belief that the cause was the growth of fungi in the cellular tissue of the tuber and vine, and many interesting pamphlets were published, and many eloquent lectures delivered, to prove this fact; but practical farmers remained sceptical, and as no remedies were proposed, they endeavored to conquer the disease by carefully selecting the seed, and paying more than usual attention to its cultivation. Still the rot spread, and instead of being an accidental sickness, it has become a regular and periodic disease, wending its venomous way with as great certainty as cholera or small pox. In 1847 Mr. Alfred Smee, surgeon to the Bank of England, author of an excellent work on electro-metallurgy, a patient observer, and an excellent microscopist, undertook the enormous difficulty of solving the great question—what the cause—where the cure—and in a little work, entitled "Smee on the Potato Plant," which he dedicates to His Royal Highness Prince Albert, he gives the results of his investigation. A little insect, so small as to be scarcely visible to the naked eye, and which he calls the *Aphis Vastator*, is in his opinion the culprit, and although he carefully explains all the symptoms of disease and all the features of the insect, yet, with the exception of recommending that the insect should be picked off some potatoes by way of trial, in his whole 150 pages he offers no remedy—suggests no cure. The Hon. Lyman Reed, of Maryland, has observed the larvæ of what he calls the *Aphis* working at the seed tubers, roots and stalks, under ground, and consequently his observations seemingly tend to confirm Mr. Smee, as the one saw the full-winged insect sucking the juices of the vines, and so destroying the plant, and depositing its eggs upon the leaf, and the young spreading rapidly, but all *above* ground and on the vine; Mr. Reed saw what he thought was the larvæ of the same insect (*Aphis Vastator*) working on the tubers, &c., under ground. This is very good, nicely scientific, and pleasant to read about, but no remedy has as yet been suggested, and for a very simple reason—the *Aphis* is not the culprit!

Mr. Smee, in paragraph 245, says that "A very small insect, which is constantly to be seen upon tubers, is a small *Acarus*, which runs about the potato very nimbly. * * There is no reason whatever for believing that it causes the malady." Mr. Smee has been on the verge of making the discovery, but neglected to observe the *Acarus*, as he calls it, closely, or he would have discovered what Mr. Alexander Henderson, of Buffalo, N. Y., has discovered, namely, that the *Phytocoris Linealaris*, of P. de Barroe, the *Capris Oblinia-atus* of Say, or the *Acarus* of Smee, is the cause of the potato rot. His reasons for coming to this conclusion, as the result of

much investigation and observation, we will now give, as we have had the benefit of his personal account, and from his plain, straightforward tale, there would seem to be no doubt that he is the discoverer of the cause and cure of the potato rot. There may be many rots, we do not know; investigation can only prove that; but that Mr. Henderson can cure one rot, similar to the one which was in Great Britain in 1847, there is little doubt, and it only remains for extended experiments, by observers in different parts of the world, to prove whether his sim-



ple remedy is applicable alike to all rots everywhere. One thing appears certain: Mr. Henderson has discovered that the *Phytocoris* are the primary cause of the potato rot, strictly so called, which first appeared in 1845, and which is identical with that of the present season.

If a tuber be examined with a microscope just before planting, on it may be seen a small, yellowish, translucent oval object, secured, as is common with insects' eggs, by a gummy substance to the potato. This will produce unsound potatoes, and the egg is that of the *Phytocoris*. When the tuber is planted at the ordinary depth, this egg hatches, but if the potato is planted deep, the egg is killed, and therefore *deep planting* is one remedy, because air and light are prevented from coming to the delicate egg. After a sufficient amount of warmth and moisture has been obtained by the egg, the shortest time that has yet been observed being six days, the shell opens along its greater axis, and out comes the small insect, without wings, from about the twentieth to a twelfth of an inch long. It has six perfect legs, two attennæ, a proboscis, and a pair of brilliant black eyes. The proboscis is about two-thirds of its body in length, and one-third of its length from the head is thick, seen coiled upon itself at *c*, Fig. 3 (which is an enlarged view of the perfect insect, taken, with the other views, from actual plants, tubers and insects, brought to us by Mr. Henderson), and the remainder is flexible and needle-like. It contains three tubes, through one of which it sucks up the juice of the plant for its nutriment; through another it probably ejects a poison into the plant, and through the other it may perform part of its respiration. The young insect being born alive, instantly requires nutriment, and commences feeding upon the seed, which, without the young are very numerous, does not perceptibly interfere with its growth. According to the amount of heat and moisture in the soil, this goes on from two and a half to three months, when the insect gets wings, and the vine has attained its full growth.

The insect has all this time been working at the tuber (Fig. 2), absorbing much of its nutritive juice, and injecting a poison, which at first appears in spots, as seen at *a*, Fig. 4. These rapidly spread to blotches, *b*, daily becoming more rotten, as *c*, and at last leaving very little of the sound potato, *d*.

The winged insect, tired of his dark underground quarters, moves a few stories higher, and settles himself upon the leaves of the vine, as seen at 1. They naturally attack the leaves and main stem, which, having their juices taken from them, wither and die, leaving little save their silicious and carbonaceous skeletons, and producing the appearance of the rot. The best evidence that a poison is also injected into the plant, is found in the fact that fungi in great abundance make their appearance, and these, as is well known, are generally the result of putrefactive fermentation.

Sometimes, in cold and stormy weather, the insect again descends and feeds upon the potato, which by this time is covered with fungi also. In the winter they emigrate, and nestling among the warm leaves of the mullen plant, endeavor to keep alive until the succeeding spring. Mr. Henderson has been engaged observing these insects since 1850, although for five years previously he had investigated the causes of the potato rot. On page 382 of the present volume of the Scientific American, we gave a brief outline of Mr. H.'s discoveries, from the Buffalo *Commercial*, which was the first newspaper that gave an extended notice of these facts.

Feeling the importance of the subject, we have given this much space to it, knowing that the majority of our readers will look with eagerness for Mr. H.'s simple remedies, which are, killing the egg by sprinkling quick-lime upon the seeds—preventing its development by deep planting, by hoeing up well round the vines, and filling up the cracks in the soil by pressure—or by preserving an old Scotch method of planting, which is as follows: The ground is plowed about a foot deep, the manure put in, with three to four inches of soil on that, and then the potato planted. Crops set in this way have never failed, the vines sometimes being attacked, but the tubers always remaining sound. We hope that many of our readers will set to work and experiment on this matter, and although the bug is very active and lively, he may be caught by shaking the vine quickly and picking him up. Mr. Henderson intends going to Europe, to bring his discoveries before the agriculturists of England and France, from whom we sincerely hope that he will meet with that success and attentive consideration that his patient investigation so richly deserves.

Scandinavia.—Professor Paul C. Sinding, late of Copenhagen, Denmark, now Professor of Scandinavian Languages and Literature in the University of New York, is about to issue a History of Scandinavia in one volume. We hail this volume from this distinguished source with much pleasure, for how little indeed is known by our most careful students of history concerning this people! The little we have read of their manners and customs, moral, social, political, religious and industrial only excites our appetite to know more about them.

Atlantic Telegraph and Fresh News.—A *scientific* gentleman put the enquiry in our office the other day, if we supposed the news communicated through the Atlantic telegraph, 2,000 miles under the *salt* water, could be *fresh* when it reached the shore.

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